CDMA PORTABLE PCS TELEPHONE

SCH-1000

SERVICE *Manual*

CDMA PORTABLE PCS TELEPHONE



CONTENTS

Samsung Electronics Co.,Ltd.
GH68-60563A
Printed in Korea.

1. Specification

1-1 General

Frequency Range	
Transmitter	: 1850 ° ≠1910 MHz
Receiver	: 1930 ° ≠1990 MHz
Channel Bandwidth	: 1.23 MHz
Channel Spacing	: 50 KHz
Number of Channels	: 1200
Duplex Separation	: 80 MHz
Type of Emission	: G7W
Input/Output Impedance	: 50 ohms
Intermediate Frequency	
Transmitter	: 130.38 MHz
Receiver	: 85.38 MHz
Local Frequency	
Transmitter	: 1st(F_{TX}-130.38), 2nd(260.76MHz)
Receiver	: 1st(F_{RX}+85.38), 2nd(170.76MHz)
TCXO Frequency	: 19.68 MHz
Frequency Stability	: (F_{RX} - 80MHz) °æ 150Hz
Operating Temperature	: -30°… ° ≠+60°…
Supply Voltage	: +4.8V
Current Consumption (Average)	
Standby	: 140mA (Non-slot mode)
Talk	: 330mA (at +10dBm)
Size and Weight	
Including Standard Battery	: 146(H)°ø54(W)°ø25(D), 220g
Including Extended Battery	: 146(H)°ø54(W)°ø33.5(D), 250g

1-2 Transmitter

Waveform Quality	: 0.944 or more
Open Loop Power Control Range -25 dBm -65 dBm -104dBm	 : -60.5dBm ° ≠41.5dBm : -20.5dBm ° ≠1.5dBm : +15.0dBm ° ≠+30.0dBm
Minimum Tx Power Control	: -50dBm below
Closed Loop Power Control Range	: °æ24dB
Maximum RF Output Power	: 200mW(+23dBm)
Occupied Bandwidth	: 1.23MHz
Conducted Spurious Emissions @1.25MHz	: -42 dBc/30KHz

1-3 Receiver

Rx Sensitivity and Dynamic Range (Rate Set 1)	: -104dBm, FER=0.5% or less : -25 dBm, FER=0.5% or less
Conducted Spurious Emission 1930 ° ≠1990 MHz 1850 ° ≠1910 MHz All Other Frequencies	 : <-81dBm : <-61dBm : <-47dBm
Single Tone Desensitization Rx power=-101dBm Tone power=-30dBm Tone offset from carrier=°æ1.25MHz	: lower than 1%
Intermodulation Spurious Response Attenuation Rx power=-101dBm Tone power 1=-43dBm Tone power 2=-43dBm Tone 1 offset from carrier=°æ1.25MHz Tone 2 offset from carrier=°æ2.05MHz	: lower than 1%

2. Installation

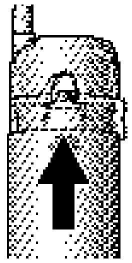
2-1 Installing a Battery Pack

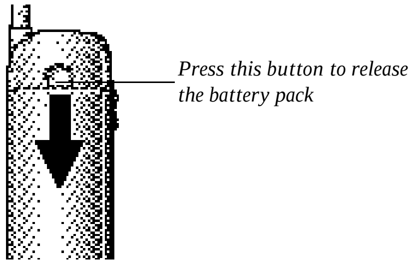
1. To attach the battery pack after charging, align it with the phone about 1cm (1/2") away from its place so that the two arrows on the phone are seen, the battery charge contacts pointing downwards.

2. Slide the battery pack upwards until it clicks firmly into position. The phone is now ready to be turned on.

3. To remove the battery pack, release it by pressing the button on the rear of the phone.

4. Slide the battery pack downwards about 1cm (1/2") and lift it away from the phone.





2-2 For Desk Top Use

1. Choose a proper location to install the charger for desk top use.

2. Plug the power cord of the charger into an appropriate wall socket. When the power cord is connected correctly, the lamps turn on briefly.

3. To charge the battery pack, insert the battery pack into the rear slot of the charger. The lamp marked BAT on the front panel of the charger lights up red.

4. If you do not wish to use the phone while charging the battery, insert the phone with the battery pack attached into the front slot of the charger. The lamp marked PHONE on the front panel of the charger lights up red.

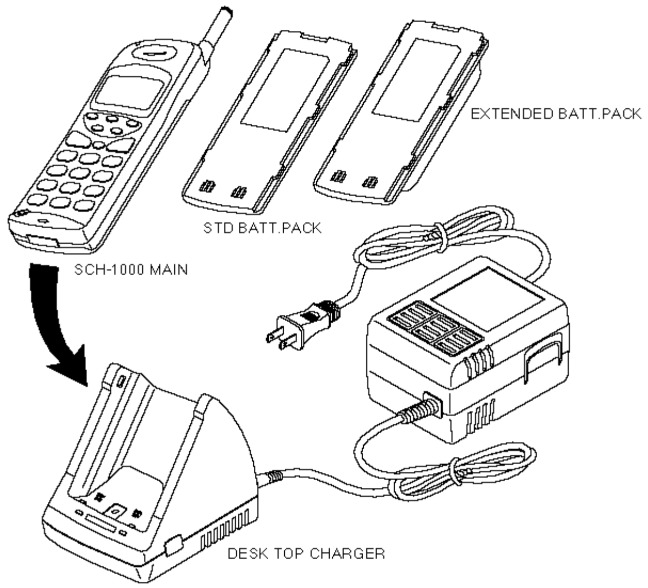


Figure 2-1 Charging The Phone and Battery

2-3 For Mobile Mount

2-3-1 Antenna

1. Choose a proper location to install the antenna.
   ¶UThe center of the roof top provides the best performance.
   ¶UThe edge of the rear trunk also provides a good performance. However, the antenna should be higher than the roof of the car.
   ¶UIn case of on-glass antenna, you should align the antenna base with the round plate to connect the cables correctly.

2. Mount the antenna vertically, connect the antenna cable.

3. Tighten the antenna nut fully.

2-3-2 Cradle

1. Choose a location where it is easy to reach and does not interfere with the driver's safe operation of the car.

2. Separate the two halves of the clamshell by removing the two large slotted screws. See the figure 2-2.

3. Drill holes and mount the lower half of the clamshell by using the screws.

4. Place the cradle onto the remaining half of the clamshell and assemble them by using the screws.

5. Reassemble the two halves of the clamshell together. Adjust the mounting angle and tighten the two slotted screws.

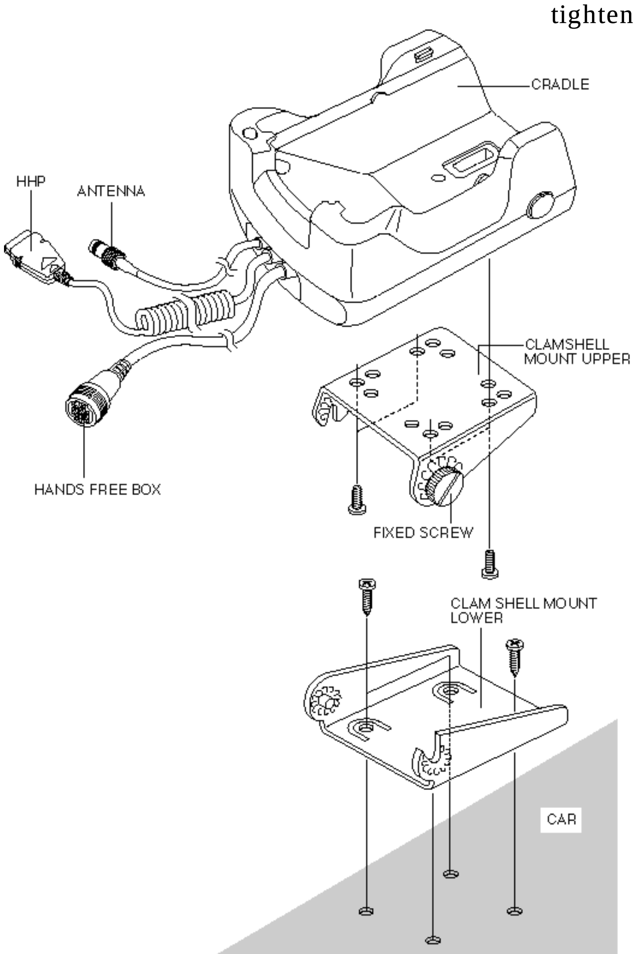


Figure 2-2 Cradle Installation

2-3-3 Hands-Free Box

1. Drill holes in a proper location for the hands-free box, attach the mounting bracket by using the screws. See the figure 2-3.

2. Install the hands-free box into the bracket.

2-3-4 Hands-Free Microphone

1. It is recommended to install the microphone where it is 30-45 cm (12-18") away from the driver. Choose the location where is least susceptible to interference caused by external noise sources, ie, adjacent windows, radio speakers, etc. Normal place is the sun visor.

2. Once the microphone has been correctly positioned, connect the microphone wire to the **MIC** jack on the hands-free box.

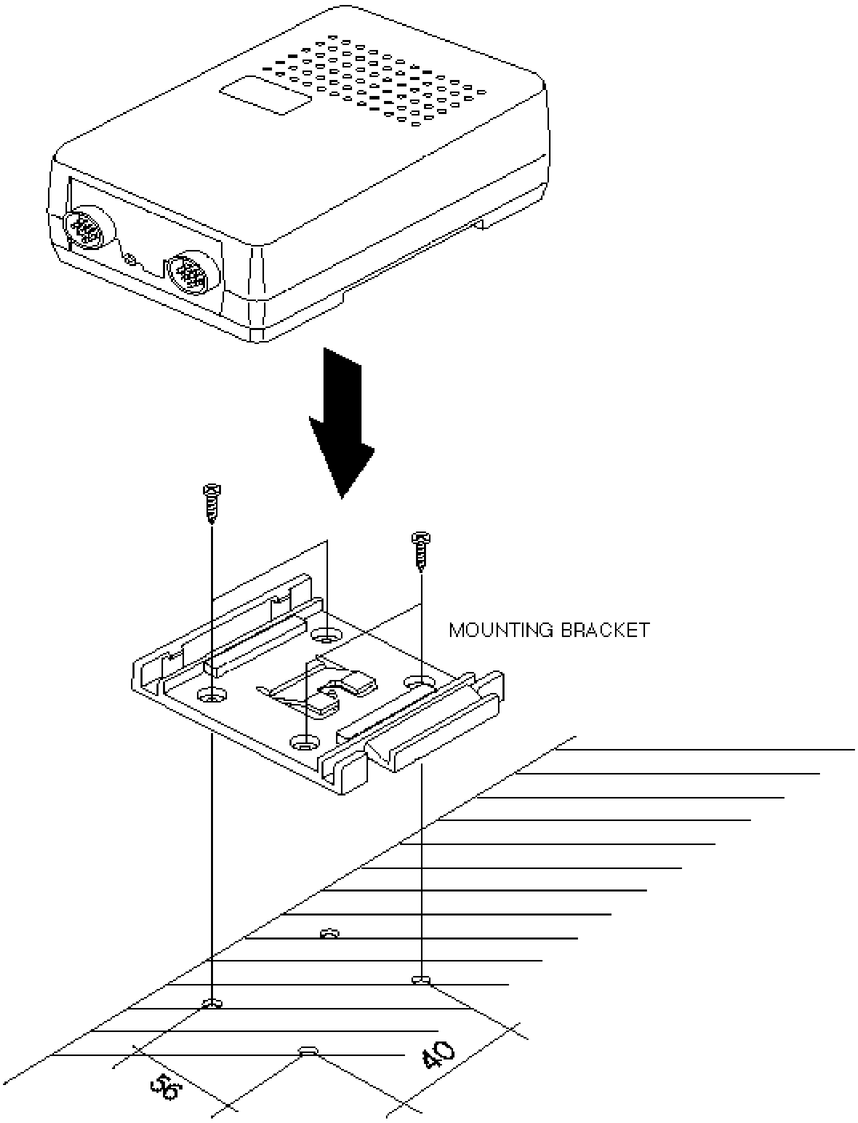


Figure 2-3 Hands-Free Box Installation

2-3-5 Cables

1. Connect the cradle and the hands-free box with the data cable. See the figure 2-4.

2. Connect the antenna cable to the **RF** jack of the cradle.

3. Connect one end of the power cable to the battery or ignition terminal. Connect the red wire to the battery (+) terminal, black wire to the vehicle chassis. Then connect the battery (-) terminal to the vehicle chassis.

4. Connect the other end of the power cable to the **PWR** jack of the hands-free box.

Notes:
¶UIt is recommended to connect the power cable directly to the battery to avoid power noise.
¶UMake sure the connection between the battery - terminal and the vehicle chassis is made correctly.
¶UMake sure the fuse having a proper capacity is used on the power cable.
¶UMake sure the cables do not pass over any sharp metal edge that may damage it.

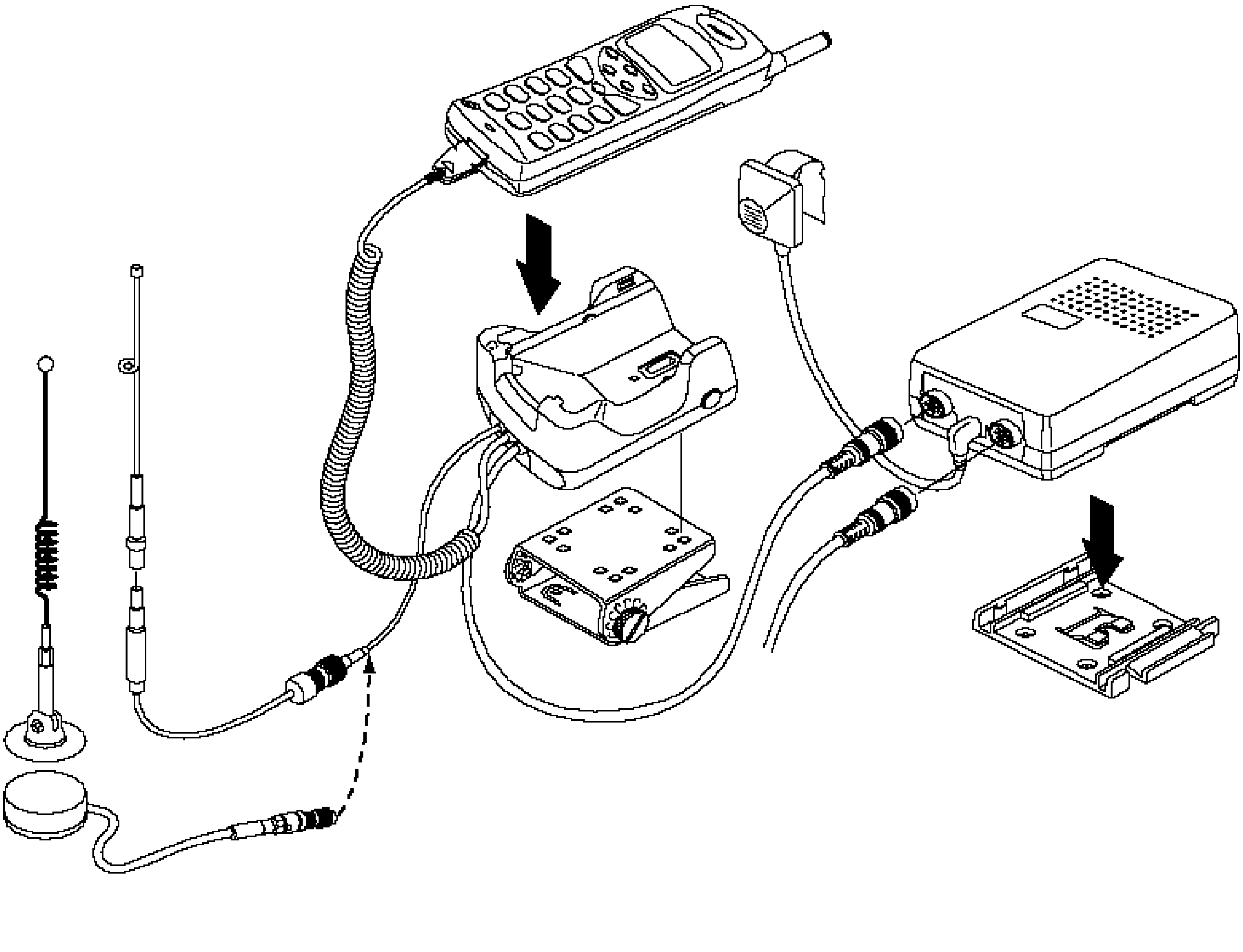


Figure 2-4 Cable Connections

3. NAM Programming

NAM features can be programmed as follows:

Notes:
-If you enter the NAM program mode, each item shows the currently stored data. Go to the next item by pressing **STO**.
-You can modify the data by entering a new data.
-If you enter a wrong digit, press **CLR** to delete the last digit. Press and hold **CLR** to delete all digits.
-To scroll items backwards or forwards, press the VOLUME button on the left side of the phone.

3-1 General Setup

LCD Display	Key in	Function
	MENU, 5, 0	-selects NAM programming
Enter Lock ??????	6-digit code	-Enter random 6-digit code (MSL)
SVC Menu°Ë°È 1:PCS Phone# 2:General	**2**	-choose 'GENERAL.'
ESN B0000000	Volume °„	-Electronic Serial Number of the phone is displayed
CAI version 1	Volume °„	-Common Air Interface version is displayed
VOC13K/8K SO_VOICE_13K	°Ëor°È **STO**	-Select vocoder service option -stores it
SCM 00001010	Volume °„	-Station Class Mark displays the power class, transmission, slotted class, dual mode.
Lock Code 0000	 4-digit code **STO**	Lock code, current status is displayed -to change, enter new code. -stores it.
Slot Mode No	 °Ëor°È **STO**	Slot mode. 'Yes' indicates the slot mode. -changes the status. -stores it.
Slot Index 2	 **0 - 7** **STO**	Slot mode index. The higher, the longer sleeping time. -to change, enter new one. -stores it.

3-2 Setting Up NAM

LCD Display	Key in	Function
SVC Menu°Ë°È 1:PCS Phone # 2:General	Volume °„	-NAM Programming Menu is displayed
SVC Menu°Ë°È 3:NAM	**3**	-choose 'Setup NAM'
IMSI_MCC 310	number **STO**	IMSI Mobile Country Code, current code is displayed. -to change, enter new one. -stores it.
IMSI_MNC 00	number **STO**	IMSI Mobile Network Code, current code is displayed. -to change, enter new one. -stores it.
CDMA ACCOLC 0	class number **STO**	CDMA Access Over load Class, current status is displayed. -to change, enter new one. -stores it.
CDMA HomeSID Yes	°Ëor°È **STO**	CDMA Home system ID, current status is displayed. -changes the status. -stores it.
CDMA fSID Yes	°Ëor°È **STO**	CDMA foreign SID, current status is displayed. -changes the status. -stores it.
CDMA fNID Yes	°Ëor°È **STO**	CDMA foreign NID, current status is displayed. -changes the system. -stores it.
SID 4120	number **STO**	first SID written in the list, current status is displayed. -to change, enter new one. -stores it.
NID 65535	number **STO**	first NID written in the list, current status is displayed. -to change, enter new one. -stores it.

4. Circuit Description

4-1 Logic Section

4-1-1 Power Supply

With the battery installed on the phone and by pressing the PWR key, the VBATT and ON_SW signals will be connected. This will turn on Q108(2SC4081). This in turn will be supplied to pin 6 of regulators U110 and U111, thus releasing them from the shut-down state to output regulated 3.3V. And then Reset Generator (U109) stays High.

The VBATT applied to ON_SW turns on Q113(DTC144) and will result in the signal ON_SW_SENSE to change state from HIGH to LOW. The MSM recognizes this signal and sends out PS_HOLD(logical HIGH) to turn on Q108 even after the PWR key is released.

The power from U110 is used in the digital part of MSM and BBA. The power from U111 is used in the analog part of BBA.

4-1-2 Logic Part

The Logic part consists of internal CPU of MSM, RAM, ROM and EEPROM. The MSM receives TCXO and CHIPX8 clock signals from the BBA and controls the phone. The major components are as follows:

¶UCPU : INTEL 80186 core
¶UFROM : U112 (LH28 F800SUHE)-8MBIT FLASH ROM
¶USRAM : U113(KM68V1000BLTI)-1MBIT STATIC RAM
¶UEEPROM : U107(24LC65-1 / SM)-64KBIT SERIAL EEPROM

CPU

INTEL 80186 CMOS type 16-bit microprocessor is used and CPU controls all the circuitry. For the CPU clock, 27MHz is used.

FLASH ROM

One 8Mbit FROM is used to store the terminal's program. Using the down-loading program, the program can be changed even after the terminal is fully assembled.

SRAM

Two 1Mbit SRAMs are used to store the internal flag information, call processing data, and time data.

EEPROM

One 64Kbit EEPROM is used to store ESN, NAM, power level, volume level, and telephone number.

KEY-PAD

For key recognition, key matrix is setup using SCAN0-6 of STROBE signals and KEY0-3 of input ports of MSM. Eight LEDs and backlight circuitry are included in the keypad for easy operation in the dark.

LCD MODULE

LCD module contains a controller which will display the information onto the LCD by 8-bit data from the MSM. It also consists a DC-DC converter to supply -3.3V for fine view angle and LCD reflector to improve the display efficiency.

4-1-3 Base Band

MOBILE SYSTEM MODEM (MSM)

The MSM equipped with the INTEL 80186 CPU core is an important component of the CDMA cellular phone. The MSM comes in a 176 pins TQFP package. The interface block diagram is shown on page4-3.

MICROPROCESSOR INTERFACE

The interface circuitry consists of reset circuit, address bus (A0-A19), data bus (AD0-AD15), and memory controls (ALE,DT-R,HWR/,LWR/, RAM_CS/,ROM_CS).

INPUT CLOCK

°§CPU clock : 27 MHz

°§TXCO/4 (pin34) : 4.92 MHz. This clock signal from the BBA is the reference clock for the MSM except in CDMA mode.

°§CHIPX8 : 9.8304 MHz.The reference clock used during the CDMA mode.

BBA INTERFACE

CDMA,Data Interface

°§TXIQDATA0-7 (pin24-32) : TX data bus used during both CDMA.

°§C_RX_IDATA0-3 (pins16-20) and C_RX_QDATA0-3(pins 12-15) : RX data bus used during CDMA mode.

Clock

°§TX_CLK(pin 22), TX_CLK/(pin23) : Digital to Analog Converter(DAC) reference clock used in TX mode.

°§CHIPX8 : ADC reference clock used in CDMA RX mode.

ADC Interface

ADC_CLK (pin3), ADC_ENABLE (pin1) and ADC_DATA (pin2) are required to control the internal ADC in the BBA.

Data Port Interface

Includes the UART. Also, supports Diagnostic Monitor (DM) and HP equipment Interface.

CODEC Interface

The MSM outputs 2.048MHz PCM_CLK (pin19) and 8KHz CODEC_SYNC (pin16,20) to the CODEC (U102). The voice PCM data from the MSM (U101)PCM_DIN (pin135) is compressed into 13KHz by PureVoice algorithm in the CDMA mode.

RF Interface

TX : TX_AGC_ADJ (pin35) port is used to control the TX power level and PA_ON (pin44) signal is used to control the power amplifier.

RX : AGC_REF (pin36) port is used to control the RX gain and TRK_LO_ADJ (pin45) is used to compensate the TCXO clock.

General Purpose I/O Register Pins

Input/output ports to control external devices.

Power Down Control

When the IDLE/signal turns LOW, only the TX sections will be disabled.If both the IDLE/ and SLEEP/ are changed to LOW, all the pins except for the TXCO are disabled.

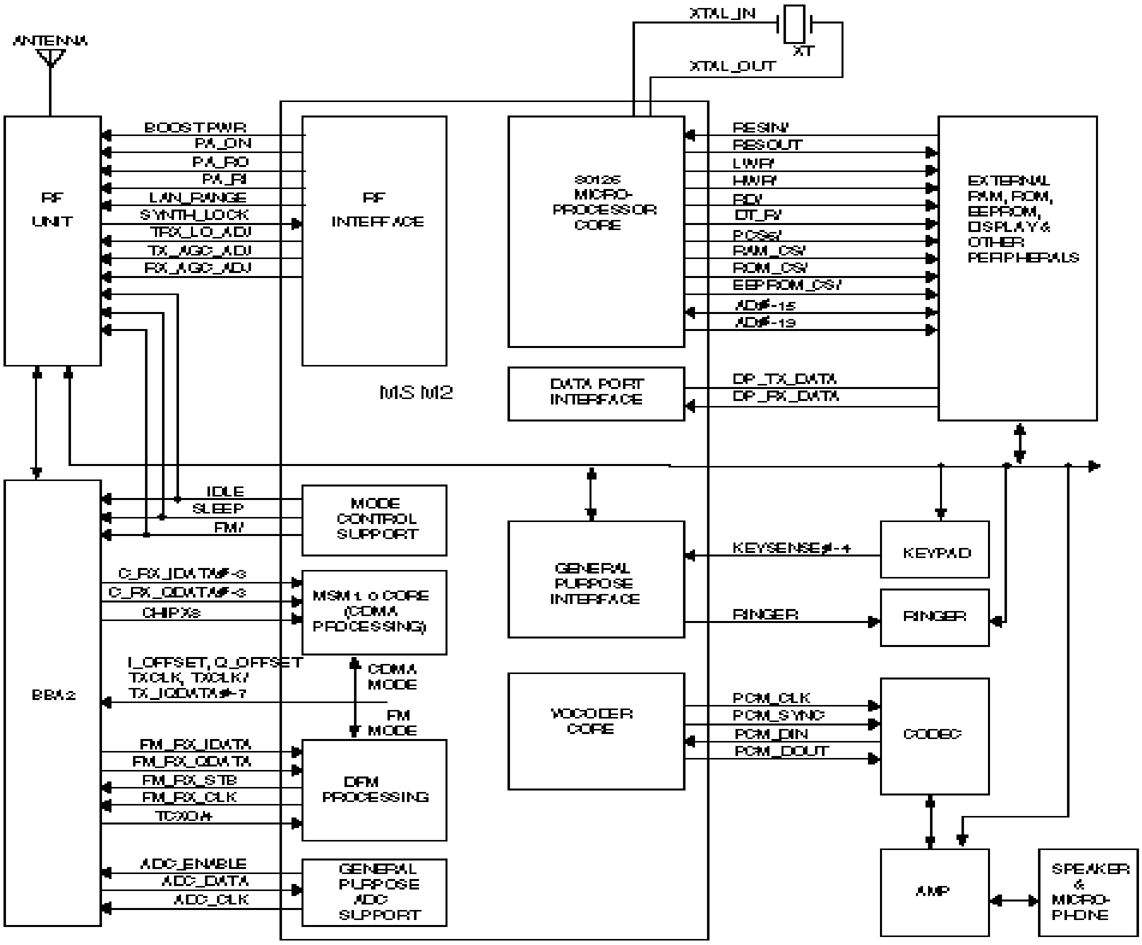


Figure 4-1 Baseband Block Diagram

4-1-4 Audio Section

TX AUDIO PATH

The voice signal output from microphone is filtered and amplified by the internal OP-AMP and is converted to PCM data by the CODEC(U102). This signal is then applied to the MSM(U101)'s internal vocoder.

RX AUDIO PATH

The PCM data from the MSM are converted to audio signal by DAC of CODEC(U102),is then amplified by the speaker amplifer(U105) to be sent to the speaker unit.

VOLUME ADJUST

Volume can be adjusted up to 8 steps for the user to obtain a proper loudness of received signal.

4-1-5 Buzzer Driving Circuitry

Buzzer generates alert tone. When the buzzer receives the timer signal from the MSM, it generates alert tone. The buzzer level is adjusted by the alert signal's period generated from the MSM timer.

4-1-6 Key Tone Generator

Ring signal (pin49) from MSM(U101) is passed through LPF consisting of R180, C119, R124, and C120, amplified at the speaker amp(U105) and come out to speaker.

4-2 Receiver Section

LOW NOISE AMPLIFIER (LNA)

The low noise amplifier featuring 1.6dB Noise Figure and 19dB gain amplifies a weak signal received from the base station to obtain the optimum signal level.

DOWN CONVERTER (MIXER)

First local signal is applied to this down converter. The down converter transfers the signal amplified at the LNA into 85.38 MHz IF signal. 85.38MHz IF signal is made by subtracting 1960°æ30MHz RF signal from 2045.38°æ30MHz first local signal. The LNA is Q303 and down converter is U302.

IF AMP

The IF amp (Q310) amplifies the output signal of the down converter (U302).

RF IF AUTOMATIC GAIN CONTROLLER (AGC) AMP

85.38 MHz IF signal is applied to IF AGC amp,the AGC output level is applied to BBA (Base Band Asic). The AGC amp (U303) keeps the signal at a constant level by controlling the gain. Dynamic range is 90dB, up gain +45dB, and down gain -45dB.

RF BAND PASS FILTER (BPF)

The RF BPF(F302) accepts only a specific frequency (1960°æ30MHz) from the signal received from the mobile station. The bandwidth is 60MHz.

IF SAW BAND PASS FILTER FOR CDMA

IF SAW BPF (F303) is used for CDMA system having 1.23 MHz wide band and °æ630kHz band width. The filter also climinates the image product generated at the mixer.

BUFFER

Buffer (Q311) amplifies the signal from the VCO (U305) to be applied to the local input of the down converter (U302) when a phase is locked between U304 and U305.

The VCO (U305) generates the signal having 2045MHz center frequency and °æ30MHz deviation with the voltage control. PLL IC(U304) controls this signal.

PHASE LOCKED LOOP (PLL)

Input reference frequency is generated at VCTCXO (U306) and the local signal is generated at VCO. PLL compares the two signals and allows the VCO controlled by voltage to generate the desired signal with pre-programmed counter.

VOLTAGE CONTROLLED TEMPERATURE COMPENSATED CRYSTAL OSCILLATOR

It provides 19.68MHz reference frequency to PLL (U304,U402) and BBA (U401). A correct frequency tuning is made by the voltage control.

DUPLEXER

Duplexer (F301) controls to transmit through the antenna only the signals within acceptable Tx frequency range (1880°æ30MHz) and to receive through the antenna only the signals within acceptable Rx frequency range (1960°æ30MHz). It also matches LNA(Q303) input in receiving part and PA output in transmitter part with the antenna.

4-3 Transmitter Section

POWER AMP MMIC

Power Amp MMIC (U407) amplifies signal to be sent out to the base station through the antenna.

DRIVER AMP

The driver amp (Q411,Q413) allows the input signal to the power amp MMIC(U407) to be within a specified level.

UP CONVERTER (MIXER)

The up-converter (U405) receives the first local signal to generate 1880°æ30MHz from the signal controlled by TX AGC amp (U404). 1880°æ30MHz signal comes out of the mixer output by adding 130.38MHz IF signal to 1749.62°æ30MHz first local signal. The driver amp's reference number is Q411, Q413 and up converter's reference number is U404.

IF AUTOMATIC GAIN CONTROLLER AMP

The signal output from BBA (Base Band ASIC) should be a constant level. The TX IF AGC amp (U404) controls power to keep the signal at a desired level. Dynamic range is 85 dB, up gain +40dB, and down gain -45dB.

POWER SUPPLY REGULATOR

The power supply regulator (U414) generates the regulated power.

ANTENNA

ANT1 allows signals to send and to receive to from the base station.

RF BAND PASS FILTER (BPF)

The RF BPF (F402) accepts only a specific frequency (1880°æ30MHz) to send it out to power amp MMIC. The bandwidth is 60MHz.

POWER SUPPLY SWITCHING

Power supply switching (Q412) turns on TX POWER when the phone is in traffic mode and supplies power to the circuits.

ISOLATOR

Isolator (I401) is used to reduce a reflected signal to protect the power amp MMIC from being damaged.

POWER SUPPLY REGULATOR

The power supply regulator (U413,U414) supplies a regulated power to each part of transmitter. U413 supplies 4.8V to Tx driver (Q411,Q413) and Power Amp MMIC (U407). U414 supplies 4.2V to the others.

4-4 Hands-Free Kit

Hands free board is largely composed of car adapter circuit and Hands free circuit.

4-4-1 Car Adapter Circuit

POWER SUPPLY

Input power switching circuit : This circuit includes Short protection circuit, and Power switching control circuit. It supplies power for HHP and hands free kit.

+13.5V switching circuit (Q801, 802) : This circuit switches power for power amplifier using MPU mute signal.

HHP power circuit : This circuit is Switching regulator. Input voltage is +13.6v, output voltage is +5.8v.

Vcc regulator (U704) : This circuit regulates Vcc (+5V).

CHARGER CIRCUIT

This circuit charges battery pack by detecting the temperature of battery, the slope of temperature, the slope of the voltage of battery, and charging time, etc.
During charging, the charger LED turn on red. When charging is completed, the charger LED turns on green.

Battery Type	Capacity	Charge Current	Charge Voltage
Standard	850mAH	300mA	6.2V
Extended	1500mAH	600mA	6.7V

Voltage detection circuit : Charging circuit is designed to stop charging when the voltage of battery is dropped.
The voltage of battery is entered to A / D converter located in U703 #2.

Temperature detection circuit : The temperature of battery is measured by missing NTC thermistor. NTC themistor has a characteristics of Log-scale. It obtains a linear characteristics by the parallel connection of resistors.

4-4-2 Hands Free Circuit

POWER SUPPLY (U704,U808)

+5V is regulated by U704 for hands free circuit, and -5V is regulated by U808.

TX PATH

The audio signal from external mic(JP705) flows into U802 pin #11. U802 includes Amplifier and Control circuit for hands free operatin. U801A amplifies input signal. Output signal is transmitted to HHP.

RX PATH

Input audio signal cancels noise by difference amplifier (U801c). U802 performs hands free action. The RX audio signal is input (U805). The speaker drive amp (U804) amplifies the Rx audio signal and the output of U804 goes out of speaker.

4-5 Desk-Top Rapid Charger

4-5-1 Description

The following document will provide the specifications for SAMSUNG-SPRINT's battery charger unit, system #PCS, which be sold as an accessory to cellular telephone, model SCH-1000/RC.
The bettery charger sequentially charges two NiMH batteries that are to be used with the cellular telephone.
The first slot will be able to accommodate a battery attached to the cellular telephone. The second slot can be used a spare battery.

This charger supports several types of protection mode and intelligent algorithem to cope with abnormal cheminal reaction, early cut-off, excessive temperature, battery short/open, etc.

Two bi-color LED indicate charging status of each battery type. Charging current is automatically controlled and battery type is indentified by the resistance between BATT_R(RR) and GND(B–) contact of battery.

4-5-2 Specification

This specification is applied to every unit of PCS/RC, revision level 0.

4-5-3 Interface Requirements

I/O DESCRIPTIONS

The interface requirements for the charger base will consist of the following signals.

Wall Adaptor Interface

Signal	Technology	Type	Description	From/To
+13V	Analog	I	Supply Voltage	Wall Adaptor

Battery Interface

Signal	Technology	Type	Description	From/To
BATT1+	Analog	I/O	Positive Conductor	Battery1
BATT1-	Analog	I/O	Negative Conductor	Battery1
NTC1	Analog	I	Thermistor Input	Battery1
RR1	Analog	I	Type Check	Battery1
BATT2+	Analog	I/O	Positive Conductor	Battery2
BATT2-	Analog	I/O	Negative Conductor	Battery2
NTC2	Analog	I	Thermistor Input	Battery2
RR2	Analog	I	Type Check	Battery2

BATTERY CHARGING CURRENT

- EXTENDED BATTERY : 900mA °æ 10%
- STANDARD BATTERY : 630mA °æ 10%

BATTERY DISCHARGING CURRENT

- 200~350mA

ENVIRONMENT SPECIFICATION

- Temperature
  Operating 0 to 45°C
  Storage -25 to 85°C
- Humidity 10 to 90%
- Atospheric pressure 6.5 x 10^4 to 1.05x 10^5 Pascals

BATTERY INDENTIFICATION

- EXTENDED BATTERY : 330 OHM resistance between RR and B–
- STANDARD BATTERY : 680 OHM resistance between RR and B–

LED INDICATION

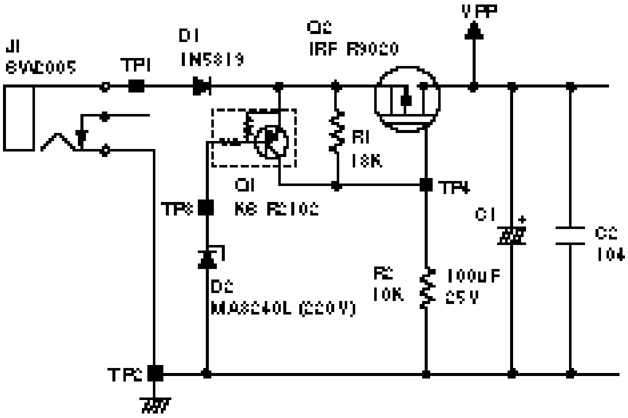
- DC POWER ON : Instantaneous YELLOW flickering of both LED.
- SLOT INDENTIFICATION
  LED 'LEFT' : FRONT SLOT (PHONE)
  LED 'RIGHT' : REAR SLOT (BATT)
- CHARGING STATUS
  RED : CHARGING
  GREEN : CHARGING TERMINATION (Full Charge)
  YELLOW : LOW BATTERY (WAIT)
  FLASHING YELLOW : DISCHARGING
  FLASHING R °Ê G °Ê Y, FLASHING RED : Hardware Error.
  OFF : BATTERY UNLODED, etc...

MECHANICAL SPECIFICATION

- The cahrge unit will be enclosed within a plastic housing that is terminated on one end by a DC wall adapter.
- Dimensions
  CASE MATERIAL : POLY CARBONATE (LEXAN 940)
  COLOR : BLACK
  WEIGHT : About 300g

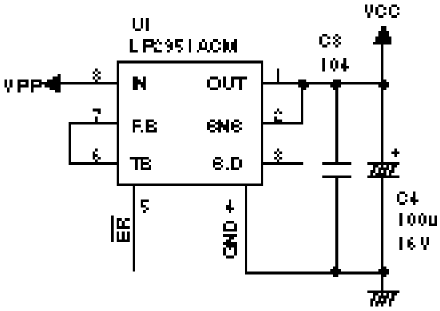
PROTECTION CIRCUIT FOR EXCESSIVE VOLTAGE

The norminal voltage of Zener diode D2 is 22V and the reverse voltage by leakage current is about 14.5V.
If the input voltage is under 22V, the Q1 stays off and the gate of FET Q2 becomes low level and turns on main path. If the voltage is higher than 22V or excessive impulsive voltage is supplied, D2 becomes breakdown and turns on Q1 and turns off Q2 by raising the gate voltage to high level.



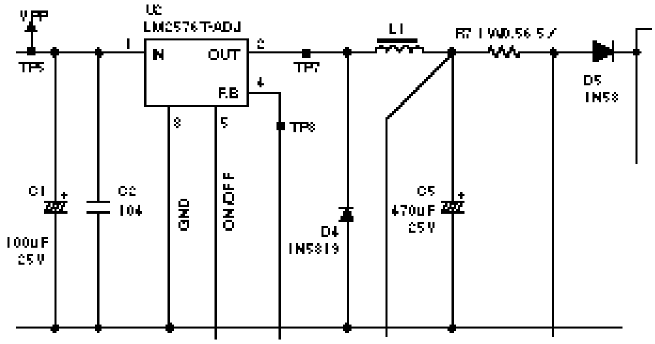
MICROPOWER VOLTAGE REGULATOR

When power is on and off, pin 5 of U1 (LP2951) detects the output voltage and keeps high / low level and the reset pin 18 of MPU becomes active by the voltage level of pin 5.
The error flag becomes high impedance state at the input voltage of under 1.3V and changes the state to low level when the voltage reaches to 5V and then resets MPU. Also the error flag becomes low state at the output voltage of under 4.75V and resets MPU.
By this way MPU can keep the input voltage of CMOS or TTL device stable and prevents malfunctions.



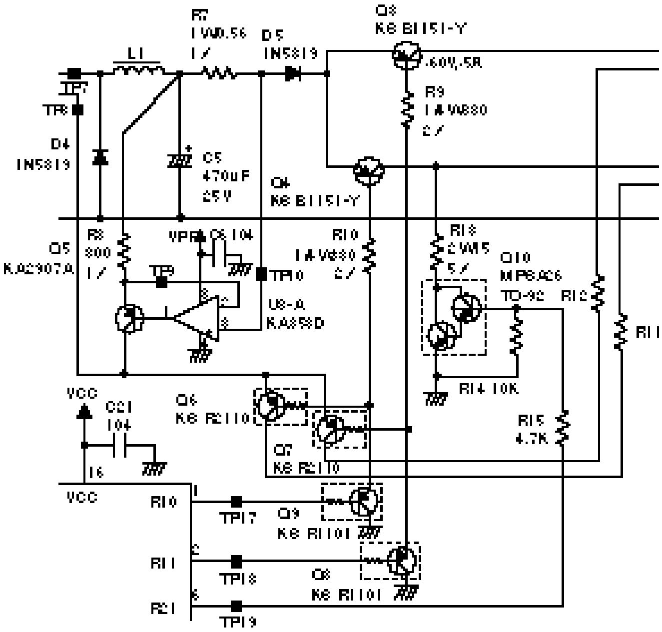
STEP-DOWN REGULATOR

The step-down buck converter is composed of U2 (LM2576T-ADJ), L1, D4 and C6. And U2 choppers the output by switching operation in 52 kHz internally fixed frequency. Pin 5 is connected to pin 3 of MPU and becomes on / off and controls the output voltage by adding / subtracting the feedback voltage of pin 4. D4 is a diode to flywheel the energy of L1 when the switching TR of Buck circuit is off.



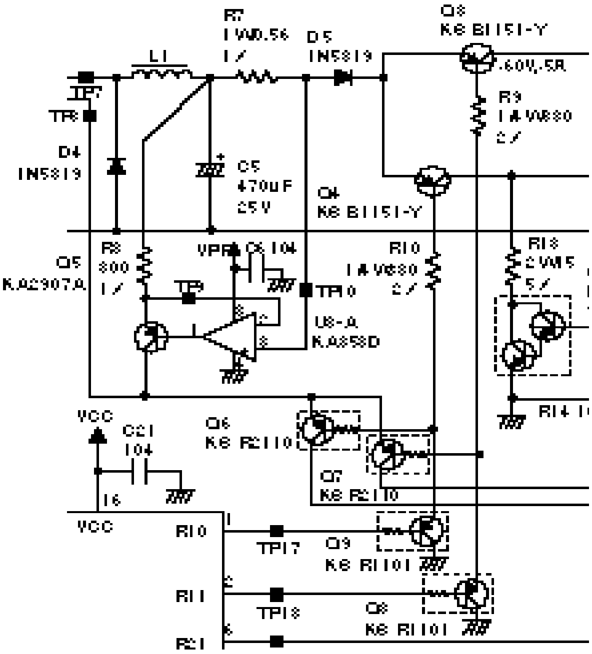
CONSTANT CURRENT CIRCUIT

As the constant current circuit which is adapted with PCS / RC, is just one directional, it can be used as power source of OP-amp.
By applying and fixing input bias current to N.1 terminal of U3, the sink current is controlled by shunt resistor R7, R8, R12 and RR of the battery pack.



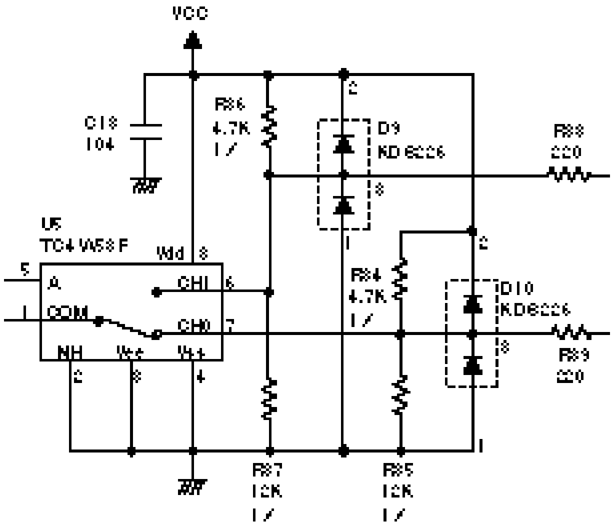
CHARGE MAIN PATH

MPU turns on Q8 or Q9 with high level output from pin 2 for front port and pin 1 for rear port. Q8 and Q9 pull down the base voltage level of PNP TRQ3 and Q4. It turns on main path, then charging is started.



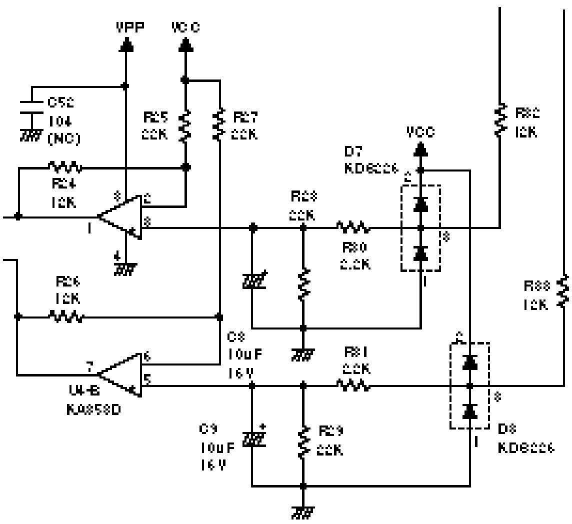
BATTERY TEMPERATURE DETECTION

The temperature of the battery pack in the front port and rear port is detected by R36/R37 and R34/R35, respectively, and measured as A/D value at MPU pin 15.
Analog switch U5 selects 2 channels (CH1 : pin 6, CH2 : pin 7) sequentially by the Enable Pulse of MPU pin 19 and assigns the NTC voltage of the front and rear batteries to pin 1 of U5.



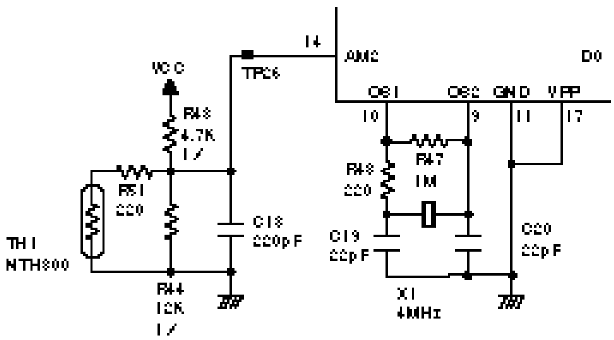
DETECTION OF CHARGE VOLTAGE

The battery voltage of front port is divided by R28, R30 and R32, measured as A/D value by MPU pin 12 through OP-amp. And the battery voltage of rear port is divided by R29, R31 and R33, and measured as A/D value by MPU pin 13.



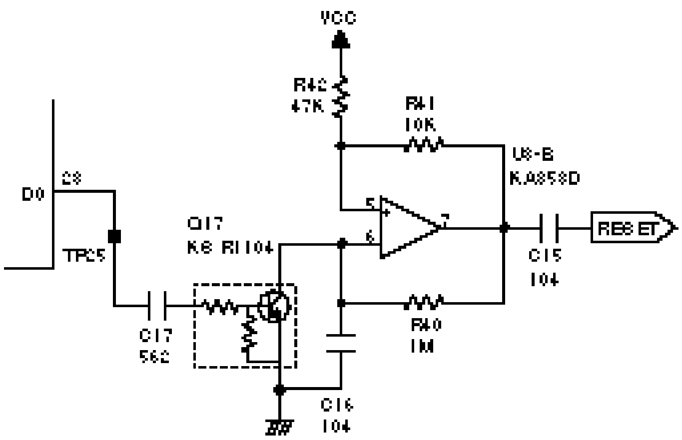
MONITORING AMBIENT TEMPERATURE

Ambient temperature is detected by R43 and R44/R61+TH1 and measured by MPU pin 14.
As the temperature is very important, it is constantly checked once program is started.



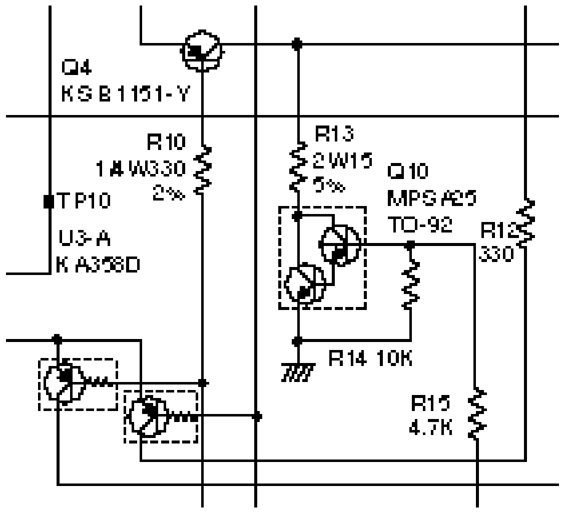
WATCH DOG

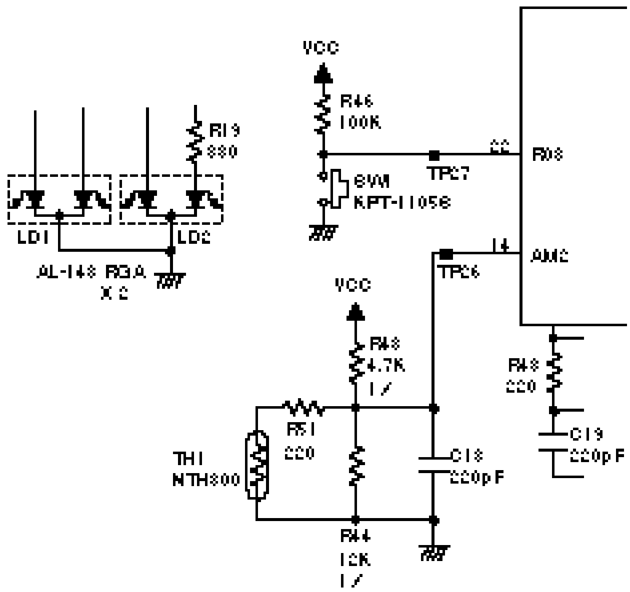
It is possible that battery is overcharged if charger stops operation by keeping on charging port by external impact.
To avoid it, timer (U3-B) is prepared and MPU is forced to be reset if MPU dosen't clear timer until a specified time is elapsed.



DISCHARGE CIRCUIT

Discharging battery is available in the rear port and initiated once pin 22 of MPU acknowledges the depression of discharge switch.
Discharging is controlled by pin 6 of MPU and stops operation once the voltage is reached to 1V/cell and automatically starts charging routine.





4-6 Cigarette Lighter Adapter

4-6-1 Funtional Specification

SUMMARY

This standard describes on the specifications of CLA(Cigarette Lighter Adaptor) for the SCH-1000 of SAMSUNG.

CLA AS ADAPTOR AND CHARGER

¶UAdaptor
directly supplies power in order to operate cellular phone independent of the battery pack.

¶UCharger
for the NiMH battery pack

ELECTRICAL SPECIFICATION

¶UInput Voltage : 11V to 16.5V DC
(normal voltage : 13.5V DC)

¶UOutput Current
- HHP POWER : supplies 100mA if cellular phone mode is in stand_by state and 300mA to 600mA in carrier_on state.
- Battery Charge Current : 390mA +/- 10%
(carrier_off) 10ßÃ°æ10ßÃ(carrier_on, full_charge)

¶UOutput Voltage (when 2K•ÿ is loaded to the battery charge terminal)
- Battery Charge Terminal : 5.8°æ0.5V
- HHP POWER Terminal : 5.8V(+/- 0.3V)

¶URipple & Noise : 50mVp-p

¶UNormal Fuse Capacity : 250V, 2A

¶UCharge Time : 3Hrs. at 850mAh6Hrs. at
1500mAh

ENVIRONMENTAL SPECIFICATION

¶UTemperature
- Operating Temperature : 0°… to 50°…
- Storage Temperature : -20°… to 85°…

¶UHumidity
- Operating Humidity : 5% to 90%
- Storage Humidity : 5% to 95%

FUNCTIONS OF CLA

¶UProtection Circuit
Protection Circuit is the circuit against the electrical stress which is occured at unexpected conditions of the source power of CLA unit such as reverse voltage or over-current.

¶UDetection of cellular phone
If cellular phone is connected to CLA, the CLA lamp is on to display whether charge will be done normaly or not.

¶UDetect Carrier-On
In the case of Carrier-On, CLA detects the resistance of the Cellular Phone and reduces the charge current.

¶UDetect Full-Charge
If the temperature of the battery pack is higher than the temperature outside of the cellular phone, CLA detects the battery fully charged and the state will be converted to the Trickle Charge.

CLA CURL CABLE CONNECTION



PIN NO(CLC)	Description	PIN NO(HHP)
#1	HHp Power	12 or 13
#2	BATT	16
#3	Thermistor	15
#4	C/F	3
#5	GND	2 or 4 or 6

4-6-2 Schematic Description

DC-DC CONTROLLER

KA7500B(U1) is DC-DC Controller. It reads the voltage difference between E1I+ Port and E1I- Port and controls time to turn on Q1. E2I+ and E2I- turn on Q1 in the same way. U1 also supplies +5V of Reference Voltage(Vref).

STATIC CURRENT

E1I- Port of U1 detects about 1.25V untill Full-Charge and controls the TURN ON time of Q1 in order to detect 1.25V at E1I+ Port. To make the E1I+ Port detect 1.25V continuously, 0.19V of voltage reduction will be generated on R4. At the equation of V=I*R, the current of R4 is around 390mA and it will be the charge current.

BATTERY CHARGE CURRENT CUTTING BY RELATIVE TEMPERATURE

Although every battery sample applied to the SCH-1000 has almost the same battery temperature at Full-Charge, it varies according to the relative temperature.
So the battery temperature at Full-Charge may be different according to the temperature around the cellular phone.

If Full-Charge occures at 25°..., the voltage of U3C to which the battery thermistor is connected is around 2.11V and the voltage of the parallel resistance of Th1 and R18 is about 2.11V. PIN 8 of U3C will be HIGH and turn on Q3 if the temperature is up. This generates the voltage detected at E1I- of U1 around 0.1V and the charge current reduces to 40mA. If Full-Charge occurs at high temperature and low temperature, the battery temperature varies and the voltage decline of Th1 and R18 relatively varies. So the battery Full-Charge condition will be fulfilled.

PREVENT CHARGE CIRCUIT IN THE CASE OF MOBILE PHONE CARRIER-ON

In the case of Mobile Phone carrier-on, the voltage loaded on PIN-13 of U3D is lower than that of PIN-12. So PIN-14 ouputs HIGH and Q3 is TURN ON again. It results to the Prevent Charge.

LED-DRIVING CIRCUIT

When battery is inserted to CLC, the voltage loaded to PIN-2 of U3A is lower than that of PIN-3 and PIN-1 outputs HIGH. This TURN ON Q7 and drives LED.

4-7 Travel Charger

4-7-1 Description

This document defines the functional requirements of SCH-110TC, SCH-1000TC, designed as a Ni-MH battery charger for SCH-110, SCH-1000.
This charger can be used with indoor AC input directly.
One LED indicates charging status of battery.
Charging current mode is constant current mode controled.

4-7-2 Scope

This specification is applied to every unit of model no. SCH-110TC, SCH-1000TC, revision level 0.

4-7-3 Reference

REFER TO TEST PROCEDURE

4-7-4 Electrical Characteristic

<u>AC INPUT</u>

– AC INPUT VOLTAGE : 120Vac nominal
– AC INPUT VOLTAGE RANGE : 90-140Vac
– AC INPUT CURRENT : 0.3A max.
– AC INPUT FREQUENCY : 60°æ3 Hz

<u>OUTPUT</u>

– BATTERY CHARGING VOLTAGE : 4.8 ~ 8.0 VDC nominal
– BATTERY CHARGING CURRENT RANGE under C-C <u>Mode</u> : 350°æ20mA
– CHARGING CURRENT SETTING : 350°æ 10mA with 120Vac input and 18•ÿ load resistance.
– BATTERY CHARGING CURRENT RANGE under C-C MODE :
¶ÜSTANDARD BATTERY : 350°æ20mA
¶ÜEXTENDED BATTERY : 350°æ20mA
– EFFICIENCY : 50% min.
– RIPPLE & NOISE
¶ÜRIPPLE & NOISE LIMLT : 100mVp-p max.
¶ÜTEST CONDITION : At output contact with 20M Hz bandwidth using Battery load.

<u>SAFETY REQUIREMENTS</u>

– UL1310 APPROVAL
– FCC CLASS-B MEET
– PRIMARY-SECONDARY ISOLATION
¶ÜWithstanding voltage : 150 Vac min for 1 minute or 1800 Vac min for 1 second.
¶ÜCut-Off Current : 10mA

<u>BATTERY IDENTIFICATION</u>

BATTERY TYPE	CHARGING CURRENT	C/F - GND	LOAD RESISTANCE
EXTENDED BAT. STANDARD BAT.	350 °æ 20mA	330•ÿ or 680•ÿ	18•ÿ

<u>LED INDICATION</u>

– CHARGING STATUS
– Red : Charging

<u>ENVIRONMENTAL</u>

– UNIT OPERATING TEMPERATURE RANGE : 0 to 40 ℃Δ
– STORAGE TEMPERATURE RANGE : -10 to 70 ℃Δ

4-7-5 Mechanical Specification

– CASE SIZE : 140.8mm°ø54.4mm°ø23.9mm
– CASE MATERIAL : PC (LEXAN 940)
– COLOR : BLACK
– WEIGHT : 110g

4-7-6 Explanation Of Operating

BASIC CIRCUIT CONFIGURATION

Ttavel charger is consisted with power supply and charging controller, And this charger is also specified to input filter, rectifier, transformer, secondary filter, feed-back circuit, battery charging control circuit and LED display.

OPERATING IN EACH BLOCK

Input Filter, Rectifier

The AC power, which comes from AC-input line, is changed to DC power by following through F1, VA1, C01, LF1, D1, C03, C04.
(there are F1 for over current protection, VA1 for input surge protection, C01, LF1 and C02 for reducing noise, D01 for converting AC to DC.)

Switching Controller & Transformer

When DC power of 2.1 makes Q01 to turn-on by biasing gate of it through r03 ~ r07, the current of primary winding of T1 increases.
As a result, the energy of primary accessary winding accelerates turn-on of Q01, and the pick current of primary main winding makes q02 to turn-on by converted voltage to R02. this result reduces gate voltage of Q01, the current of primary main winding consequently. this makes reverse bias energy to gate of Q01, it is turn-off quickly. The energy transfers to secondary winding at that time.

Feed Back Circuit

The transferred energy is rectified and flattened by D20, C21 and C22.
The case of non-battery and off-state of Q20, output voltage is regulated to 8VDC by feed back sampling voltage divided by r27 and r28/r29.
U21 offers reference, compares this to sampling voltage and send the difference to PWM control circuit by OP1.

Battery Charging Control and LED Display Circuit

In the case non-battery, LED is off state by being on state of q24.
*refer to below table

	OUT-A	OUT-B	q21	q20
U23 U24	L L	H L	OFF	OFF

When battery is inserted and the voltage of comparator U23A Term.#3 is higher than the voltage of Term.#2, LED is RED color by being OFF of q24, and q21 is off because of U23A is 'L'

	OUT-A	OUT-B	q21	q20
U23 U24	L H	L L	OFF	OFF

When battery voltage is increased to the point that the voltage of U23A Term.#3 is higher than the voltage of Term.#2, battery charging current follows because q21 and Q20 are ON.

	OUT-A	OUT-B	q21	q20
U23 U24	H H	H H	ON	ON

Supplied current is converted to voltage by R21. U22A compares this to the reference, which is divided voltage by r30, r31 and r28, and transfers difference to PWM control circuit by U21 and OP1. so this charger offers constant current to battery.

U23B compares the voltage of Term. #6 to it of Term. #5, this is reference and that is sampling voltage of battery.
U23B makes U24A to ON state by decreased the voltage of U24A Term. #2 until that battery voltage is increased to wanted voltage.
This is preventing error which is causes difference of charger and battery temperature.

The voltage of U24A Term. #2 is recovered by the high output from U23B when battery voltage is increased to wanted voltage.

When battery is closes to full charge, the temperature in battery pack increases. Full changing signal is by detecting dT.

dT detecting : U24A compares the voltage level between Term. #2 and Term. #3, Term. #2 is reference which is changed on ambient temperature and NTC which is in unit, Term. #3 senses battery temperature.
this circuit is to reduce charging tolerance that is caused by ambient temperature.

When the voltage of U24A Term. #2 is higher than it of Term. #3, q21 and Q20 are OFF state. At this time, 25mA trickle current follows.

	OUT-A	OUT-B	q21	q20
U23 U24	L L	H h	OFF	OFF

The latch circuit is consisted of q22, r36 and U24A. this relaxes by battery replacement or AC power ON-OFF.

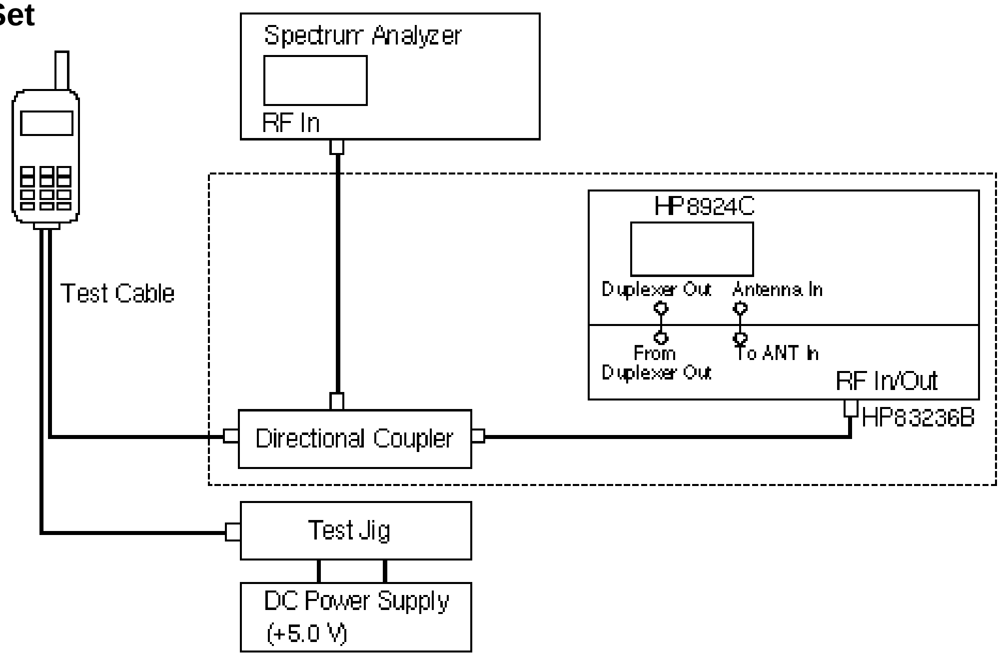
5. Test Procedure

5-1 List of Equipment

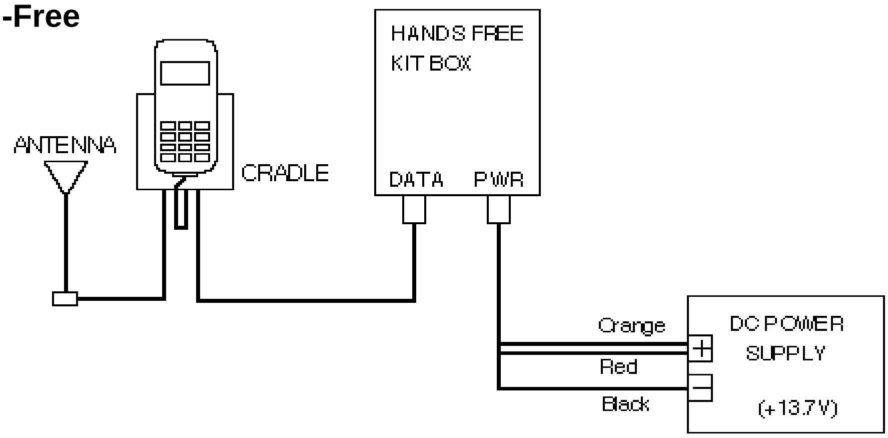
¶UDC Power Supply
¶UTest Jig
¶UTest Cable
¶UCDMA Mobile Station Test Set HP8924C, HP83236B, CMD-80, etc
¶USpectrum Analyzer (include CDMA test mode) HP8596E

5-2 Configuration of Test

5-2-1 Hand Set



5-2-2 Hand-Free



5-3 Test Procedure

5-3-1 Change to Test Mode

1. To change the phone from Normal Mode to test Mode, You should enter the following keys.
   " 4 7 * 8 6 9 # 1 2 3 5 "

2. The command° 0 1"(Suspend) is entered to start test.

3. To finish the Test Mode, You should enter the command "0 2".

5-3-2 Channel Selection and Tx Power Output level Control

1. You should change the phone from Normal Mode to Test mode

2. The command° 0 1"(Suspend) is entered to start test.

3. You should enter the following keys.
   " 0 9, 0 5 2 5, #, 0 7, 3 4, 7 1, 4 7 5, #"

   ¶Ü If you enter the command "0 9", You can select the channel
   ex) 0 9 X X X X (means channel number)

   ¶Ü The command "0 7°± means Carrier On (Carrier Off :° 0 8°±)

   ¶Ü If you enter the command "3 4", You can spread the carrier.

   ¶Ü If you enter the command "7 1", You can control the power output level. Following under-bar means AGC code. And you can control the power output level using Volume Up / Down Keys.
   ex) 7 1 X X X

4. After enter the command "7 4" and control the Tx Power Output Level to be 0.0dBm using Volume Up / Down keys, press "STO" key to store Data in EEPROM.

5-4 Test Command Table

Command No. (OP, AB, RB)	Test Command	Description
01(1F, 0, 0)	T_SUSPEND_I	Terminate the normal mode, enter to the test mode.
02(3F, 0, 0)	T_RESTART_I	Terminate the test mode, enter to the normal mode.
03(FD, 0, 0)	T_SAVE_VAL_I	Save value in EEPROM. (Only for Auto test)
04(1D, 0, 1)	T_GET_MODE_I	Get mode. (CDMA or FM)
05(1C, 1, 0)	T_SET_MODE_I	Set mode to CDMA or FM. (Only for Auto test)
06(1E, 0, 0)	T_WRITE_NV_I	Write an EEPROM item. (one of the NV items)
07(81, 0, 0)	T_CARRIERON_I	Turn the carrier on.
08(82, 0, 0)	T_CARRIEROFF_I	Turn the carrier off.
09(83, 4, 0)	T_LOADSYN_I	Set the synthesizer to the channel specified by ch_ data.
10(84, 1, 0)	T_PWRLEVEL_I	Set the RF power attenuation to the specified value.
11(85, 0, 0)	T_RXMUTE_I	Mute the receive-audio signal.
12(86, 0, 0)	T_RXUNMUTE_I	Unmute the receive-audio signal.
13(87, 0, 0)	T_TXMUTE_I	Mute the transmit-audio signal.
14(88, 0, 0)	T_TXUNMUTE_I	Unmute the transmit-audio signal.
16(8F, 0, 0)	T_STON_I	Turn on ST.
17(90, 0, 0)	T_STOFF_I	Turn off ST.
22(91,96,96)	T_SNDNAM_I	Display and send NAM information.
23(95, 3, 4)	T_SNDVERSION_I	Display and return S/W version.
24(9F, 7, 8)	T_SNDESN_I	Display and return ESN.
25(92, 0, 0)	T_BACKLIGHT_ON_I	Turn on the backlight.
26(93, 0, 0)	T_BACKLIGHT_OFF_I	Turn off the backlight.
27(96, 0, 0)	T_LAMP_ON_I	Turn on the LAMP.
28(97, 0, 0)	T_LAMP_OFF_I	Turn off the LAMP.
29(9A, 0, 0)	T_REBUILD_I	Rebuild EEPROM.
30(9D,15, 0)	T_PLINE_I	Display and return production date.
32(A0, 1, 0)	T_SATON_I	Turn on SAT.
33(A1, 0, 0)	T_SATOFF_I	Turn off SAT.
34(A2, 0, 0)	T_CDATA_I	Continuously send TX control data.
35(A3, 0, 0)	T_VOLUME_UP_I	Increase value of the last command. (Only for autotest)
36(A4, 0, 0)	T_VOLUME_DOWN_I	Decrease value of the last command. (Only for autotest)
42(AA, 1, 0)	T_DTMFON_I	Activate dtmf generator with keycode.
43(AB, 0, 0)	T_DTMFOFF_I	Deactivate DTMF generator.
44(B0, 0, 0)	T_COMPANDORON_I	Turn on compandor.
45(B1, 0, 0)	T_COMPANDOROFF_I	Turn off compandor.
50(B6, 4, 0)	T_H_LIST_I	History Channel.
57(BC, 0, 0)	T_MIC_ON_I	Mic path on.
58(BD, 0, 0)	T_MIC_OFF_I	Mic path off.
59(BE, 0, 0)	T_ALLPATH_I	Set RX Path, TX Path Unmute to Earpiece.
67(C6, 3, 6)	T_READ_BATT_I	Reads Low-Battery in the standby, talk.

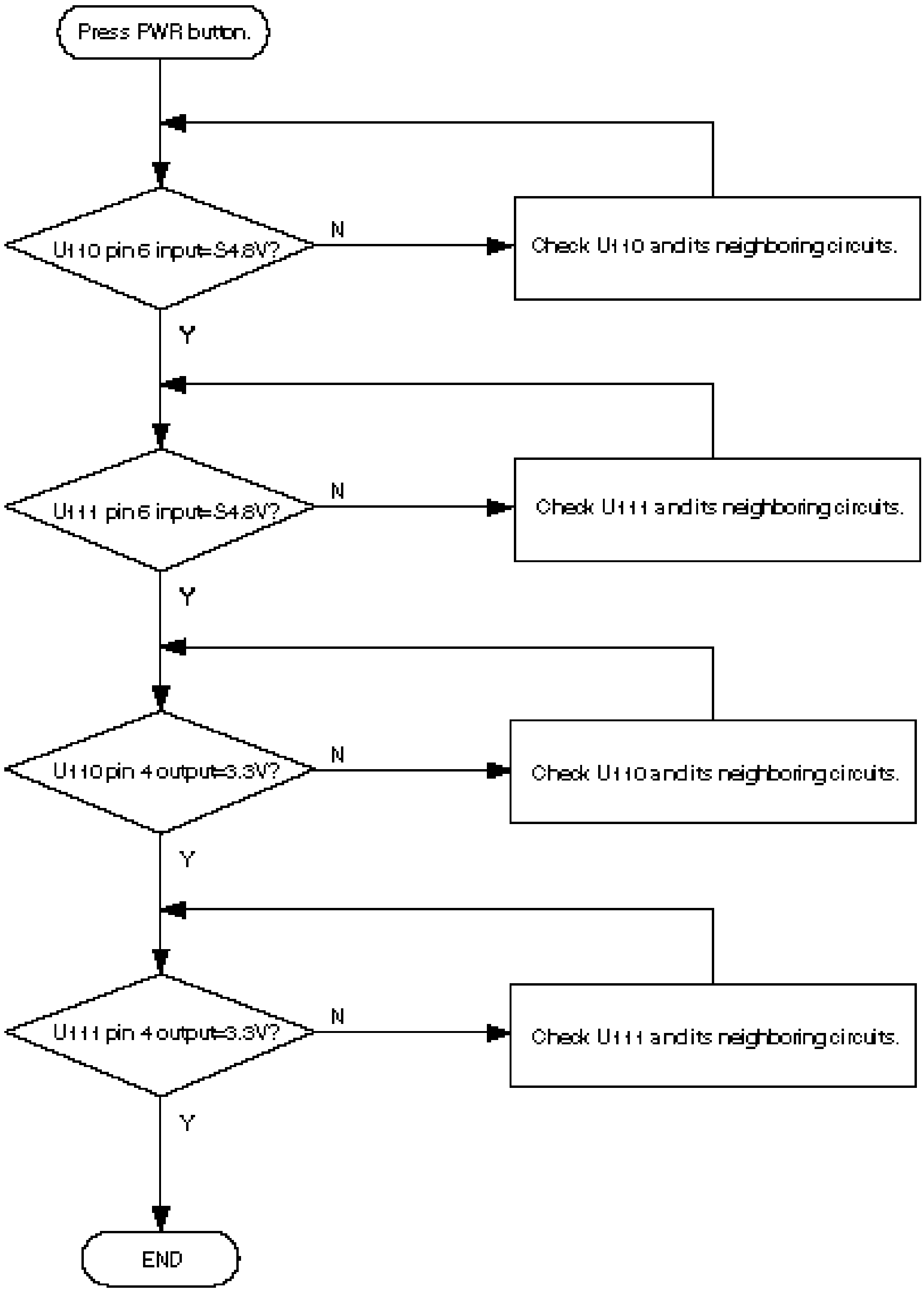
Command No. (OP, AB, RB)	Signal. Name	Description
68(C8, 0, 3)	T_VBATT1_I	Set the low battery position in the standby.
69(C9, 0, 3)	T_VBATT2_I	Set the low battery position in the talking.
70(CA, 3, 0)	T_WRITE_BATT_I	Write low battery level value to NVM.
71(D1, 3, 0)	T_CDMA_TXADJ_I	Change PDM TX AGC in CDMA.
72(D2, 3, 0)	T_FM_TXADJ_I	Change PDM TX AGC in FM.
73(D3, 1, 0)	T_SET_PA_R_I	Set PA R1, R0 in CDMA.
74(D4, 3, 0)	T_TXADJ_0DBM_I	Set TX AGC ADJ for 0dBm power.
75(D5, 0, 3)	T_READ_RSSI_I	Read a RSSI.
76(D6, 3, 0)	T_WRITE_RSSI_I	Writes RSSI.
77(D7, 0, 3)	T_READ_TEMP_I	Read Temp.
79(D9, 1, 0)	T_BUZZER_ON_I	Buzzer On at DTMF 0 key.
80(DA, 0, 0)	T_BUZZER_OFF_I	Buzzer off.
81(E3, 0, 0)	T_VOC_PCMLPON_I	Play a PCM LOOP BACK.
82(E4, 0, 0)	T_VOC_PCMLPOFF_I	Play off a PCM LOOP BACK.
84(E6, 3, 0)	T_CD_MAX_LIMIT_I	CDMA MAX limit.
85(E7, 0, 0)	T_SPEAKER_ON_I	Turn on the speaker path.
86(E8, 0, 0)	T_SPEAKER_OFF_I	Turn off the speaker path.
87(E9, 0, 0)	T_FM_LOOP-TEST_I	Play a PCM FM loopback.
88(EA, 3, 0)	T_TRK_ADK_I	TRK LOCAL ADJUST.
89(EB, 3, 0)	T_CD_TRK_ADJ_I	CDMA TRK LOCAL ADJUST.
90(F0, 3, 0)	T_CDMA_LOW_CH_HIPWR_I	Setting the volume for LOW CH highpwr. (+18dBm)
91(F1, 3, 0)	T_CDMA_LOWMID_CH_HIPWR_I	Setting the volume for LOWMID CH highpwr. (+18dBm)
92(F2, 3, 0)	T_CDMA_MIDDLE_CH_HIPWR_I	Setting the volume for MIDDLE CH highpwr. (+18dBm)
93(F3, 3, 0)	T_CDMA_LOW_CH_LOPWR_I	Setting the volume for LOW CH lowpwr. (-41dBm)
94(F4, 3, 0)	T_CDMA_LOWMID_CH_LOPWR_I	Setting the volume for LOWMID CH lowpwr. (-41dBm)
95(F5, 3, 0)	T_CDMA_MIDDLE_CH_LOPWR_I	Setting the volume for MIDDLE CH lowpwr. (-41dBm)
96(F6, 3, 0)	T_CDMA_HIGHMID_CH_LOPWR_I	Setting the volume for HIGHMID CH lowpwr. (-41dBm)
97(F7, 3, 0)	T_CDMA_HIGH_CH_LOPWR_I	Setting the volume for HIGH CH lowpwr. (-41dBm)
98(F8, 3, 0)	T_CDMA_HIGHMID_CH_HIPWR_I	Setting the volume for HIGHMID CH highpwr. (+18dBm)
99(F9, 3, 0)	T_CDMA_HIGH_CH_HIPWR_I	Setting the volume for HIGH CH highpwr. (+18dBm)

※ OP: Operation Command Number
AB: Input Argument Byte Number
RB: Return Byte Number

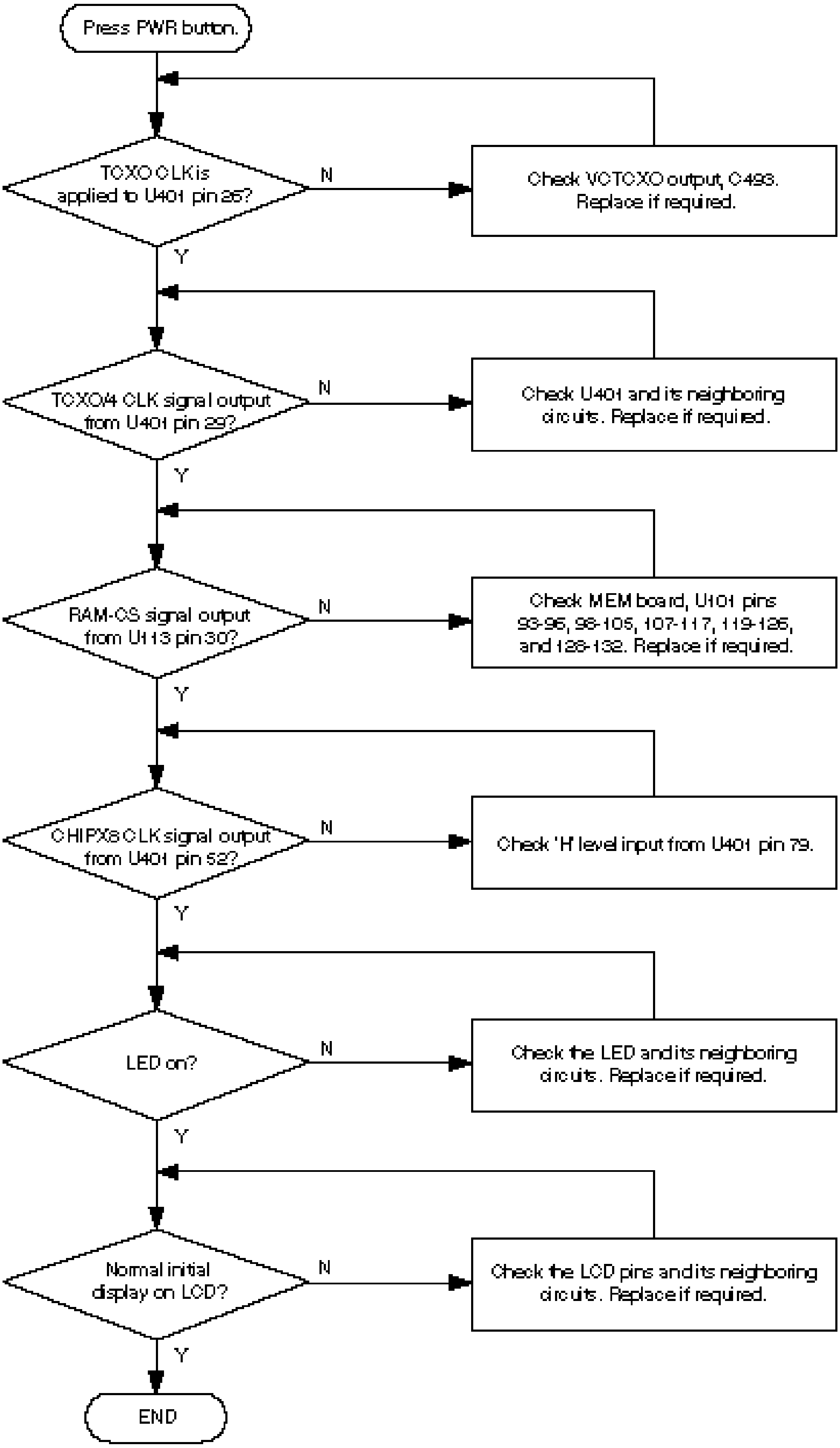
6. Troubleshooting

6-1 Logic Section

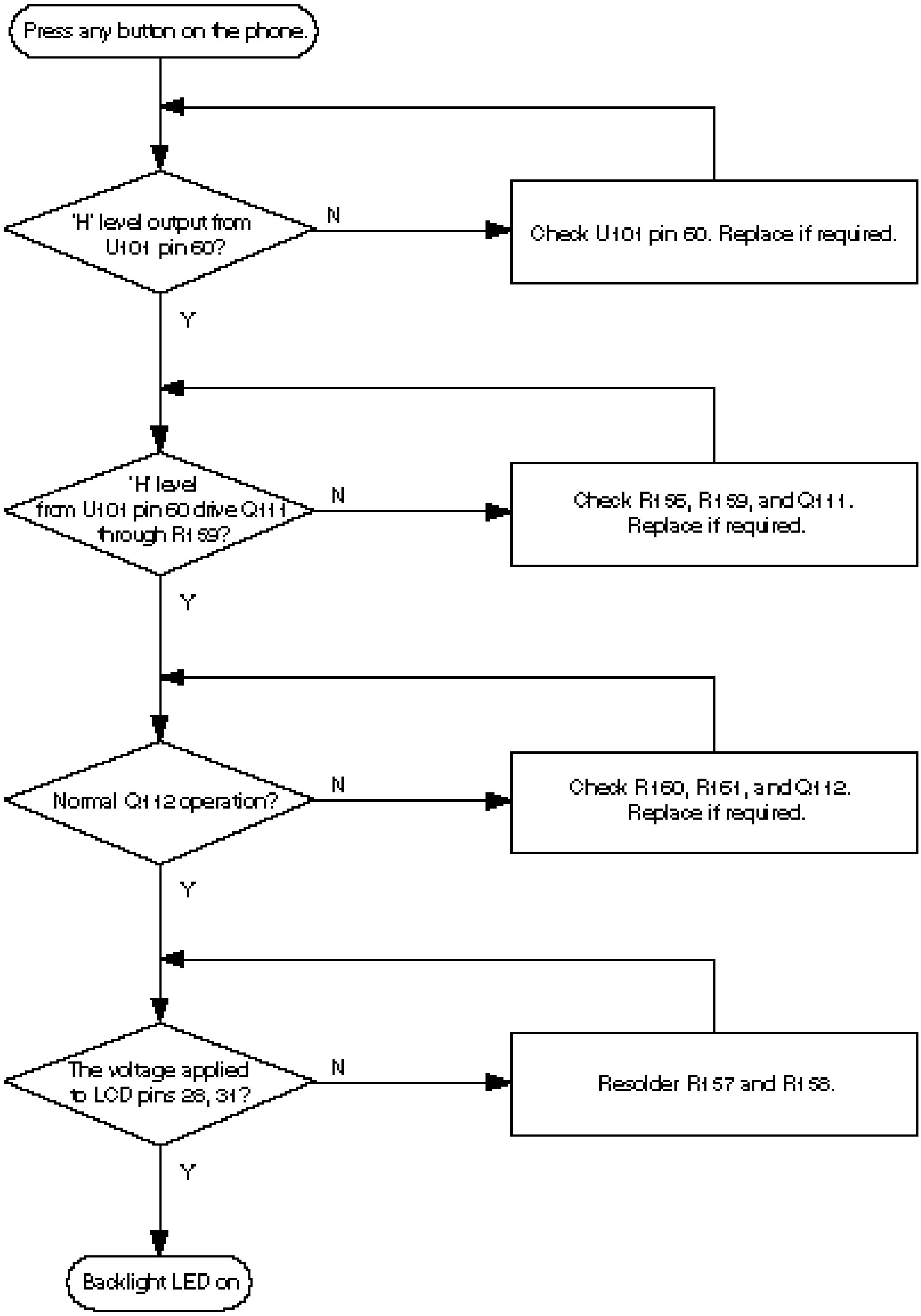
6-1-1 No Power



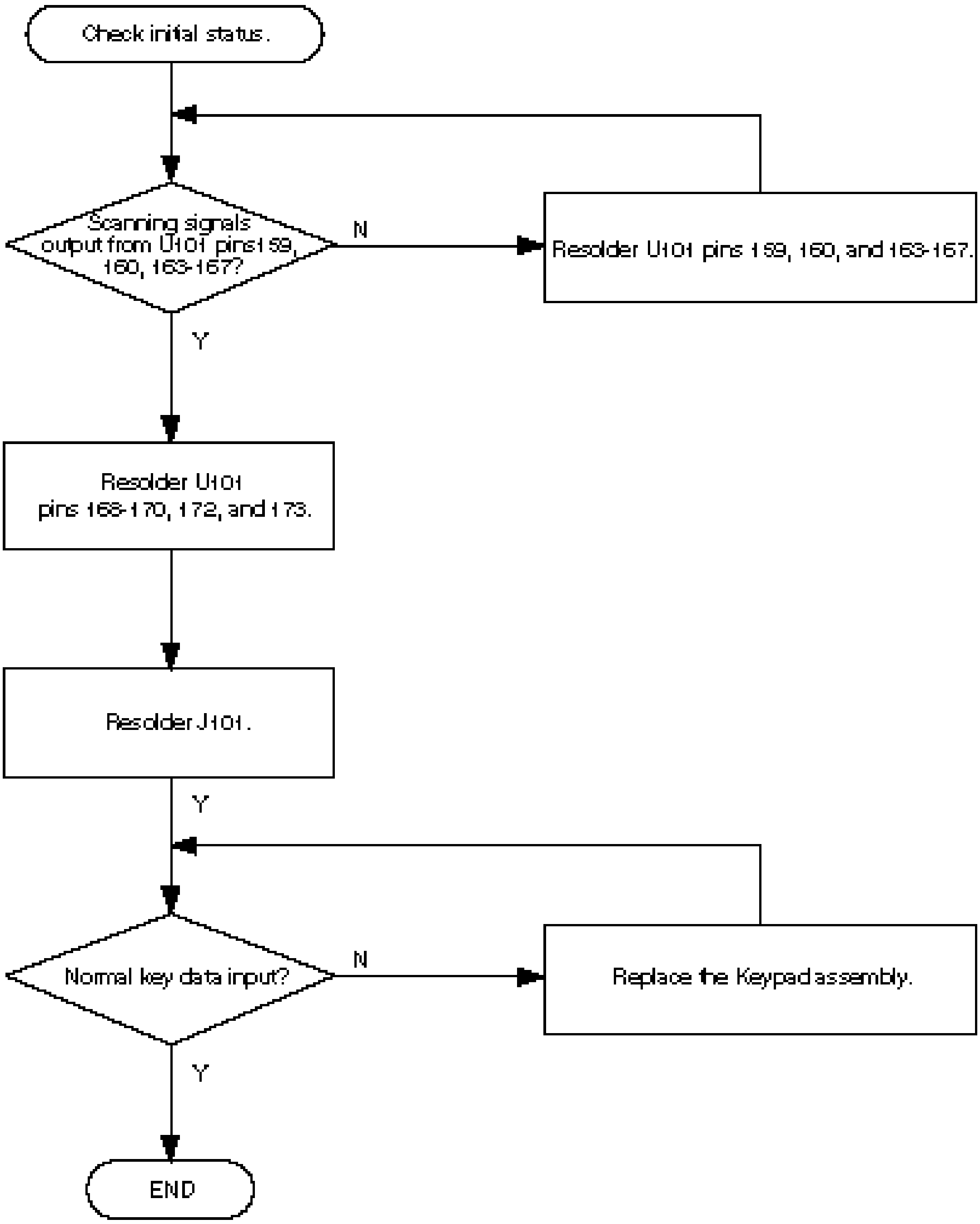
6-1-2 Abnormal Initial Operation (Normal +3.3V voltage source)



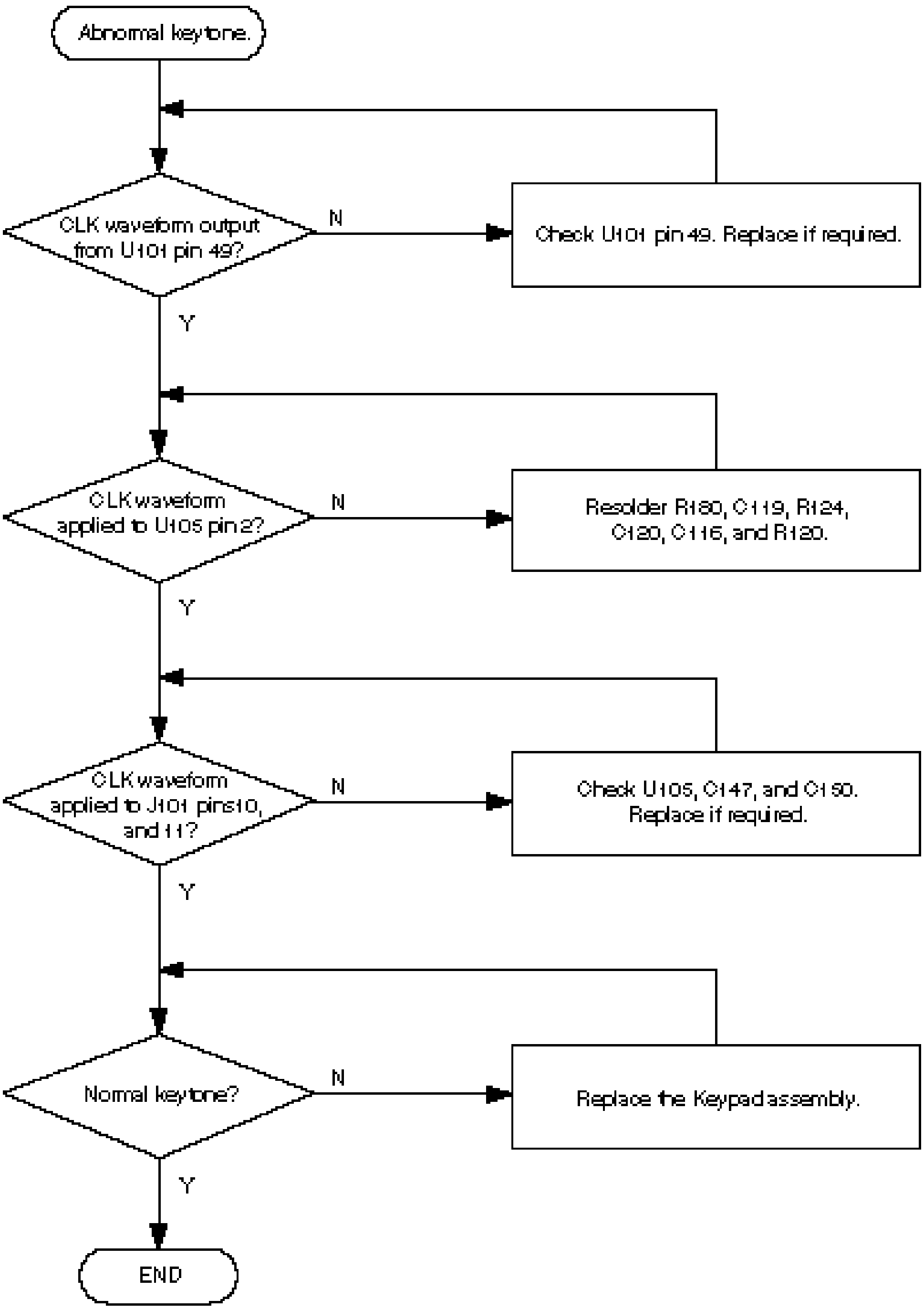
6-1-3 Abnormal Backlight Operation



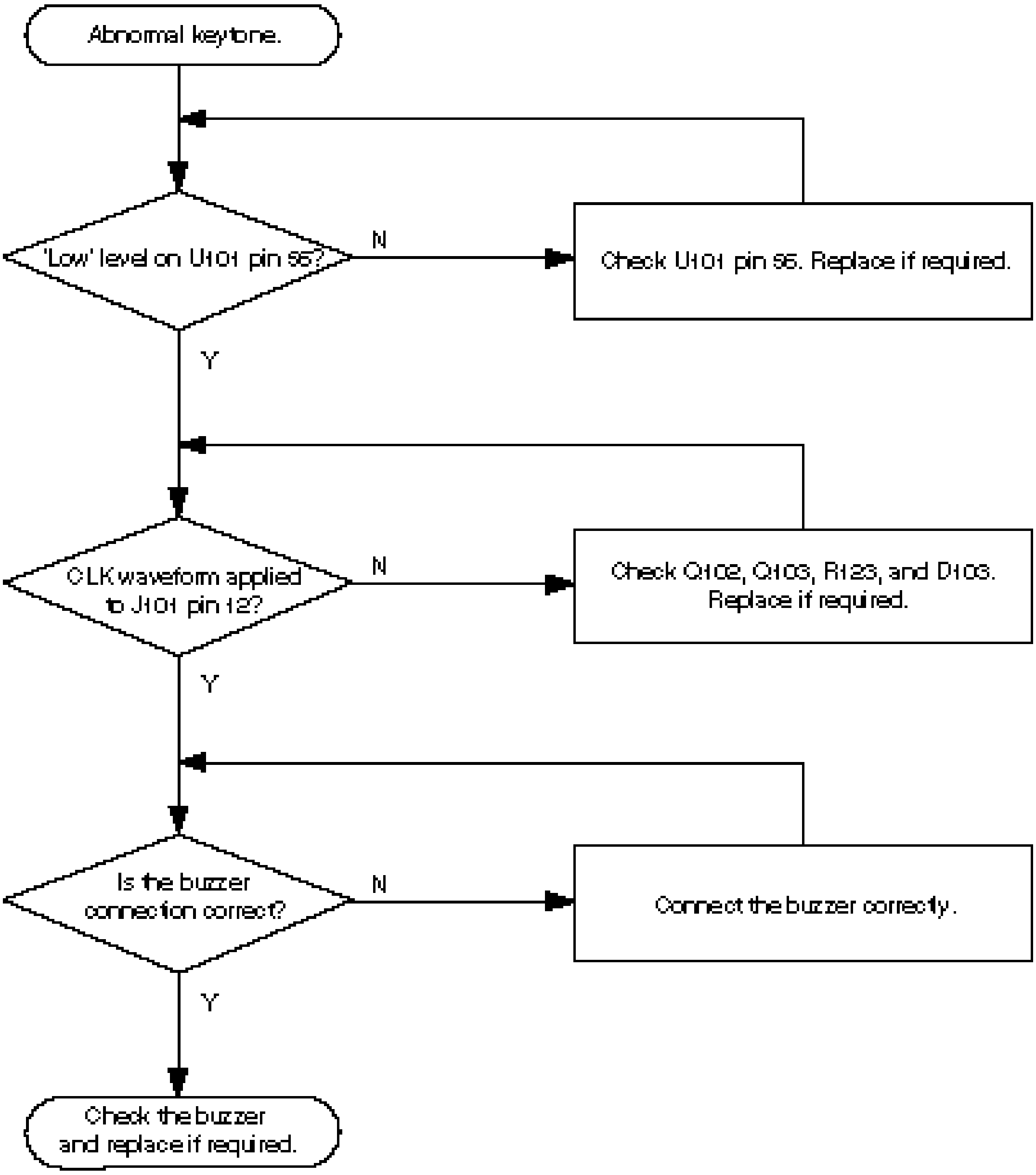
6-1-4 Abnormal Key Data Input



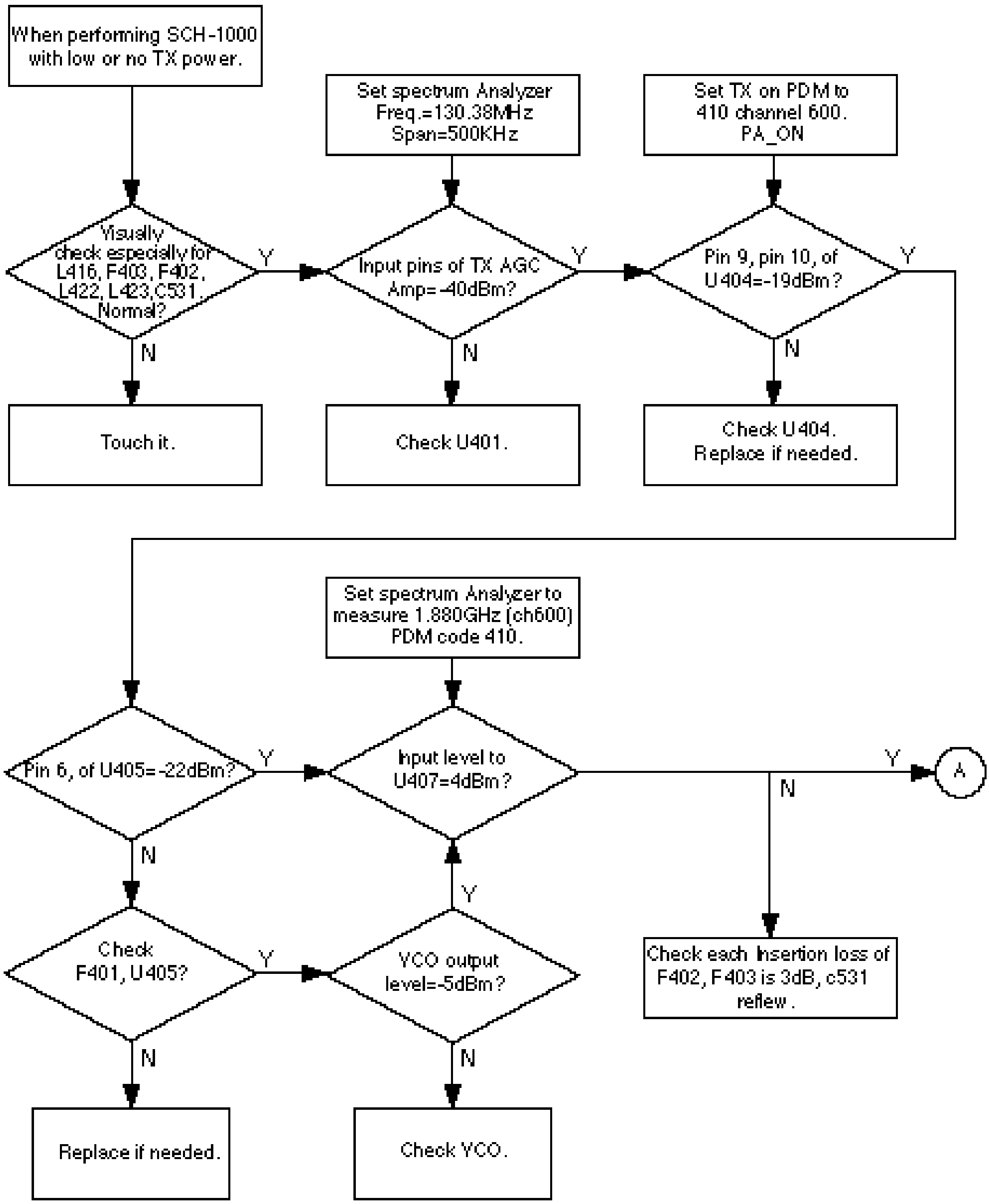
6-1-5 Abnormal Keytone

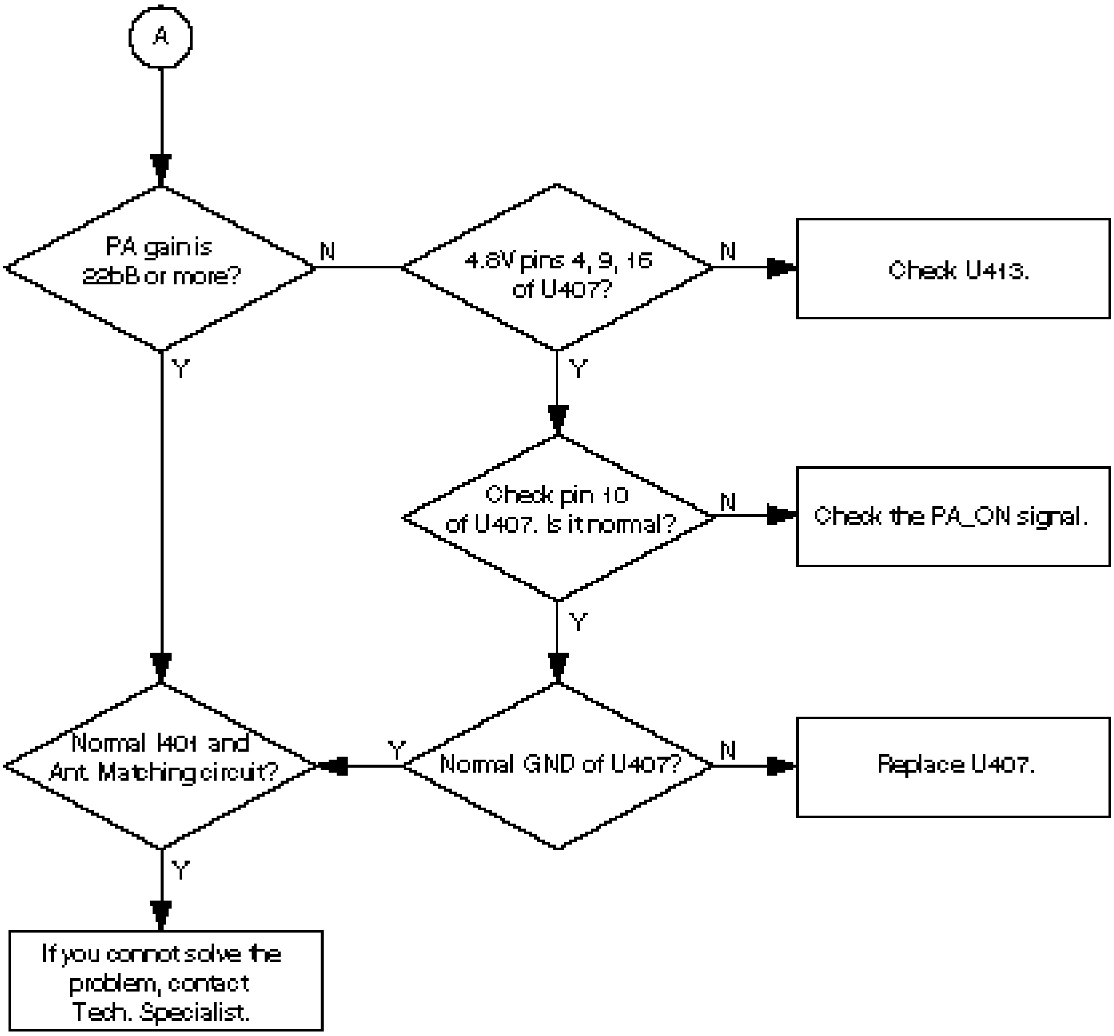


6-1-6 Abnormal Alert Tone

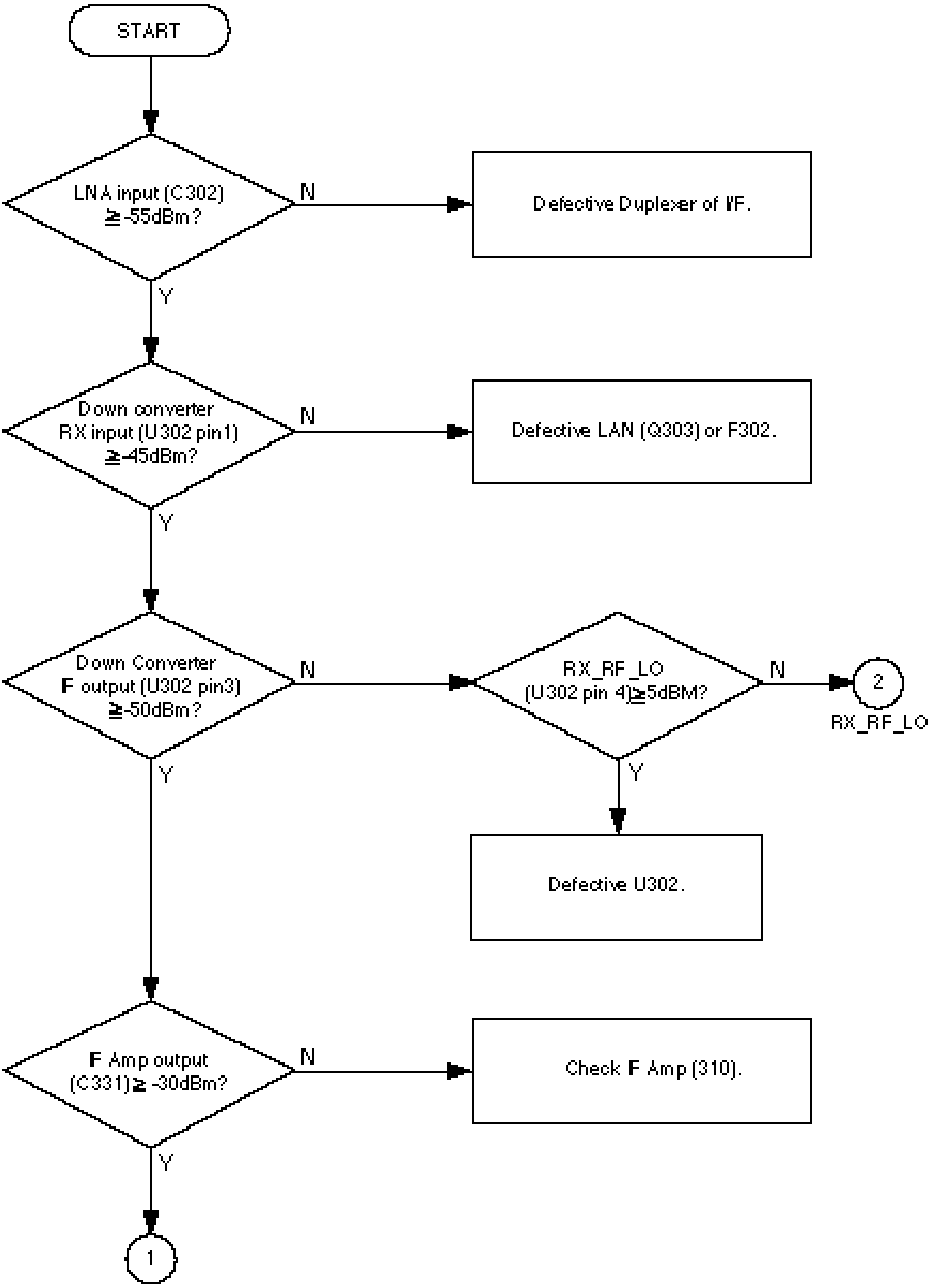


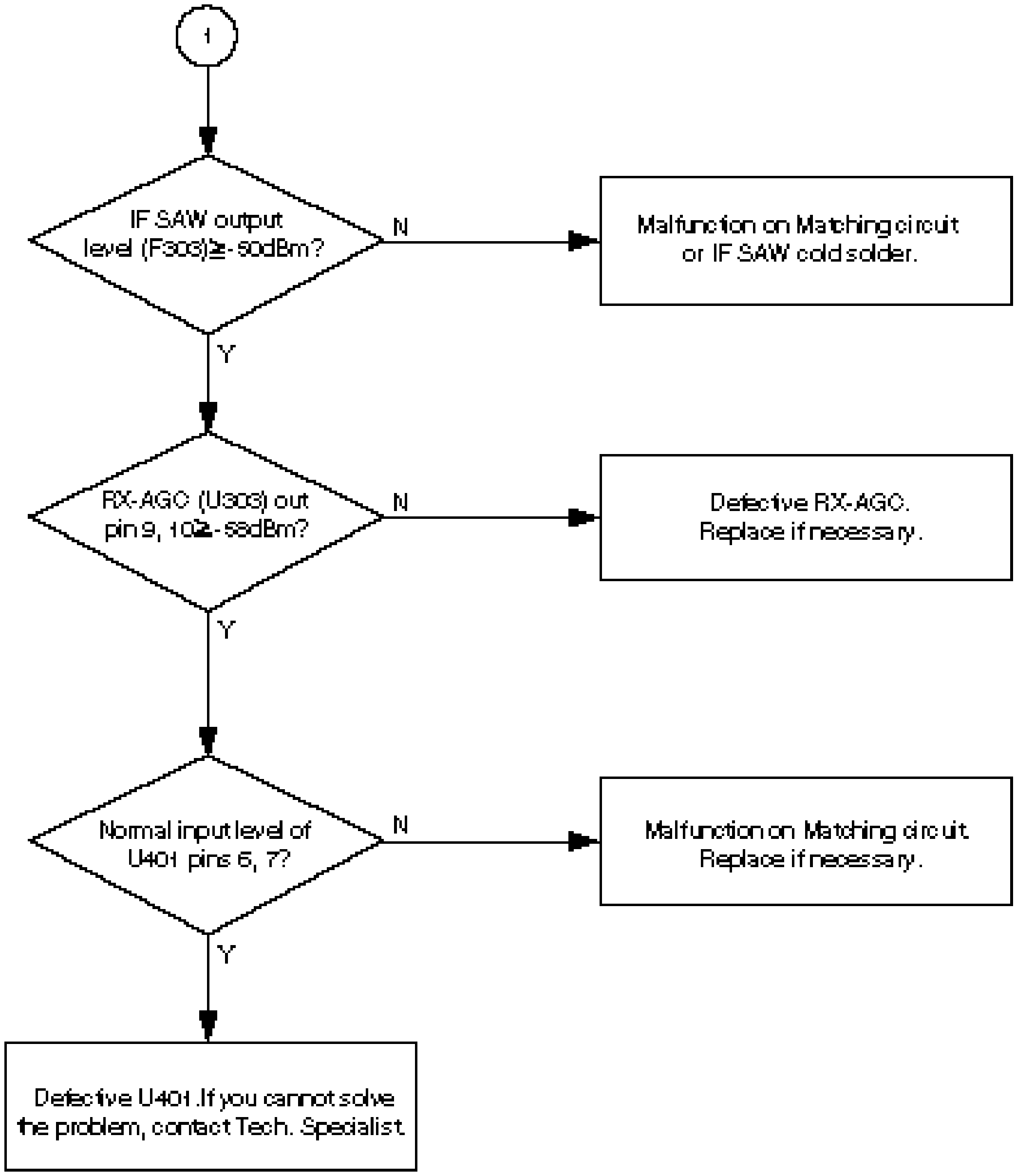
6-2 Transmitter Section

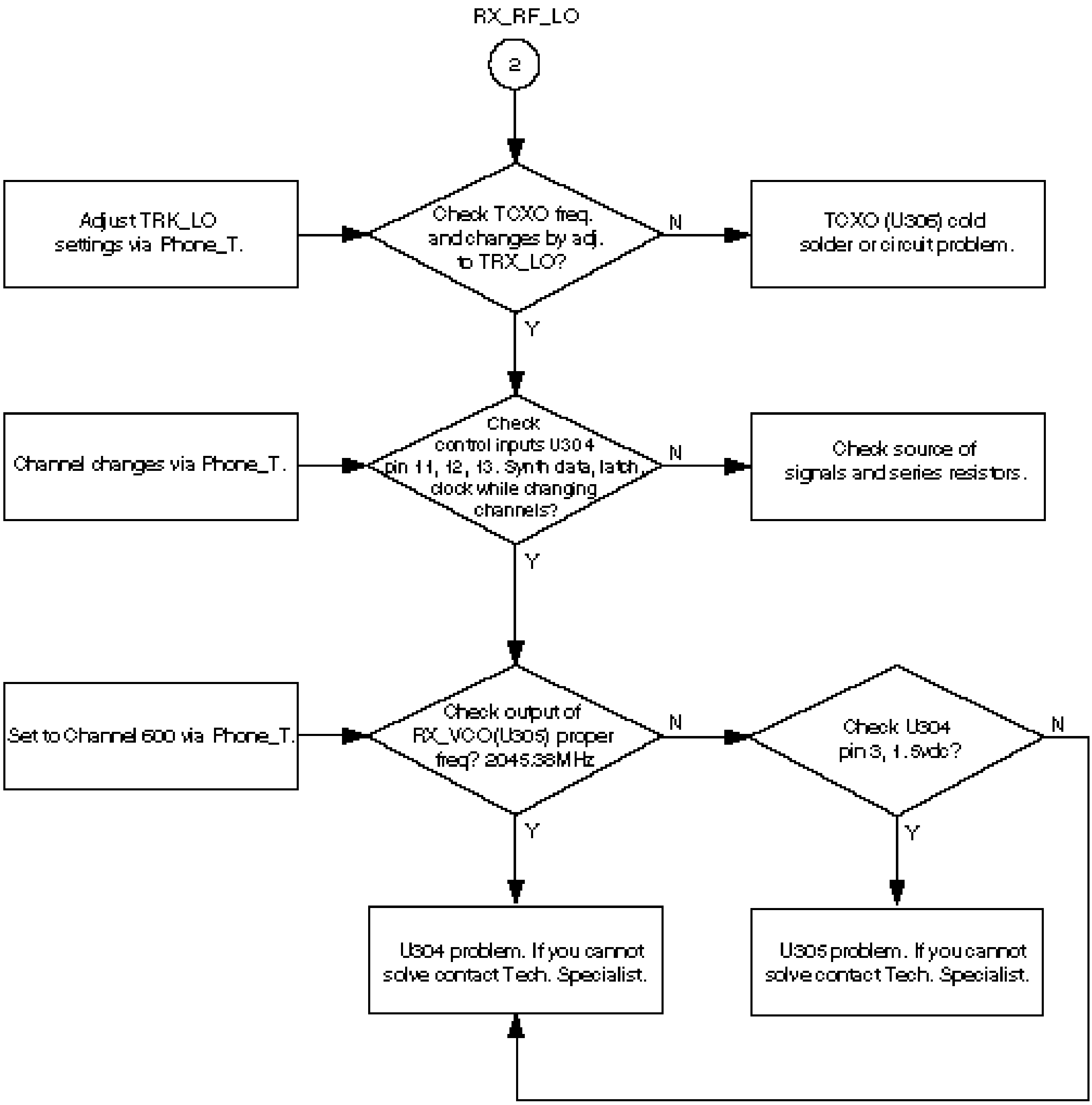



A
PA gain is 22bB or more?
N
4.8V pins 4, 9, 16 of U407?
N
Check U413.
Y
Y
Check pin 10 of U407. Is it normal?
N
Check the PA_ON signal.
Y
Normal I401 and Ant. Matching circuit?
Y
Normal GND of U407?
N
Replace U407.
Y
If you cannot solve the problem, contact Tech. Specialist.

6-3 Receiver Section

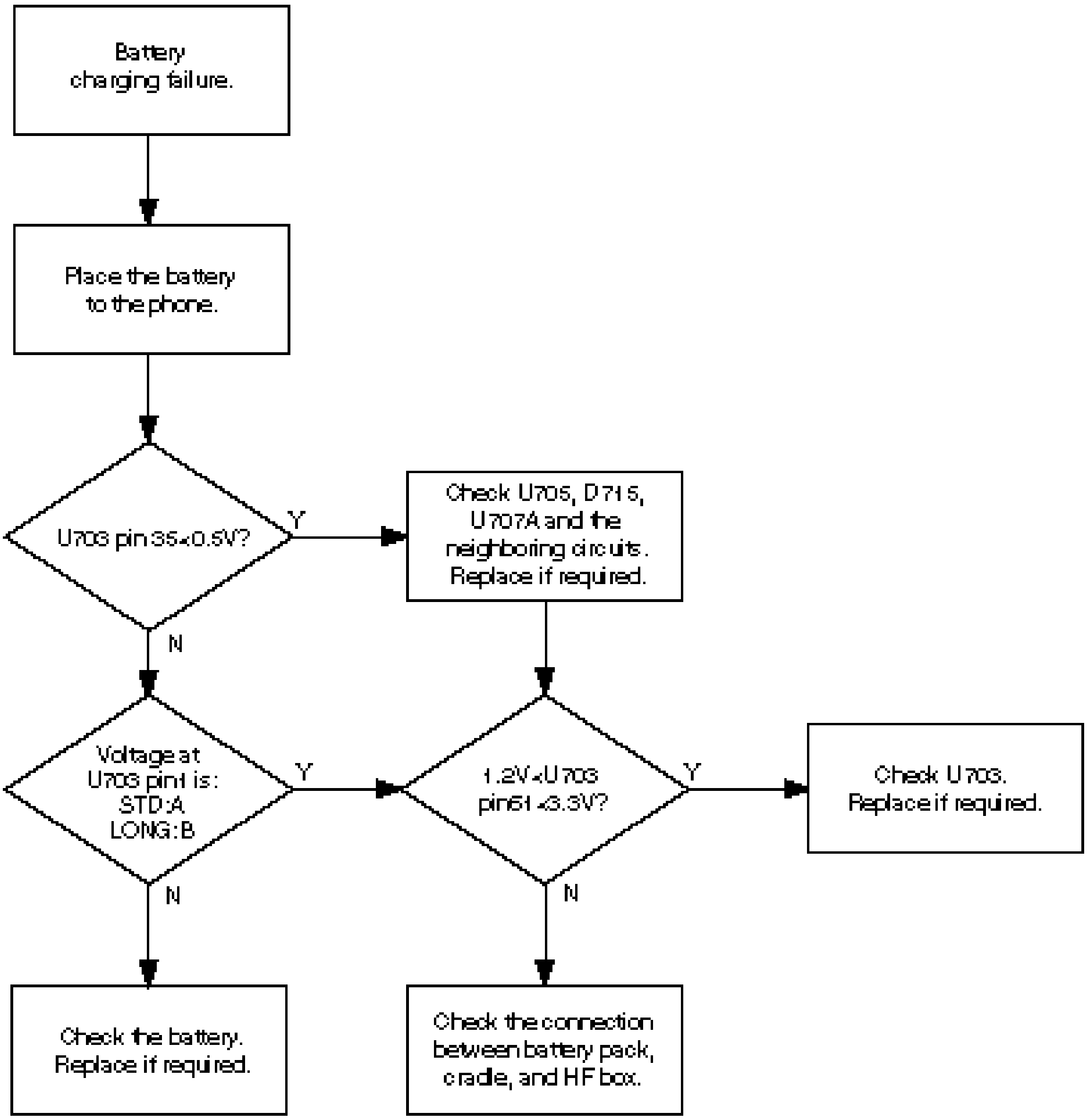



1
IF SAW output level (F303)≥-50dBm?
N
Malfunction on Matching circuit or IF SAW cold solder.
Y
RX-AGC (U303) out pin 9, 10≥-58dBm?
N
Defective RX-AGC. Replace if necessary.
Y
Normal input level of U401 pins 6, 7?
N
Malfunction on Matching circuit. Replace if necessary.
Y
Defective U401. If you cannot solve the problem, contact Tech. Specialist.


RX_RF_LO
2
Adjust TRK_LO settings via Phone_T.
Check TCXO freq. and changes by adj. to TRX_LO?
N
TCXO (U306) cold solder or circuit problem.
Y
Channel changes via Phone_T.
Check control inputs U304 pin 11, 12, 13. Synth data, latch, clock while changing channels?
N
Check source of signals and series resistors.
Y
Set to Channel 600 via Phone_T.
Check output of RX_VCO(U305) proper freq? 2045.38MHz
N
Check U304 pin 3, 1.5vdc?
N
Y
Y
U304 problem. If you cannot solve contact Tech. Specialist.
U305 problem. If you cannot solve contact Tech. Specialist.

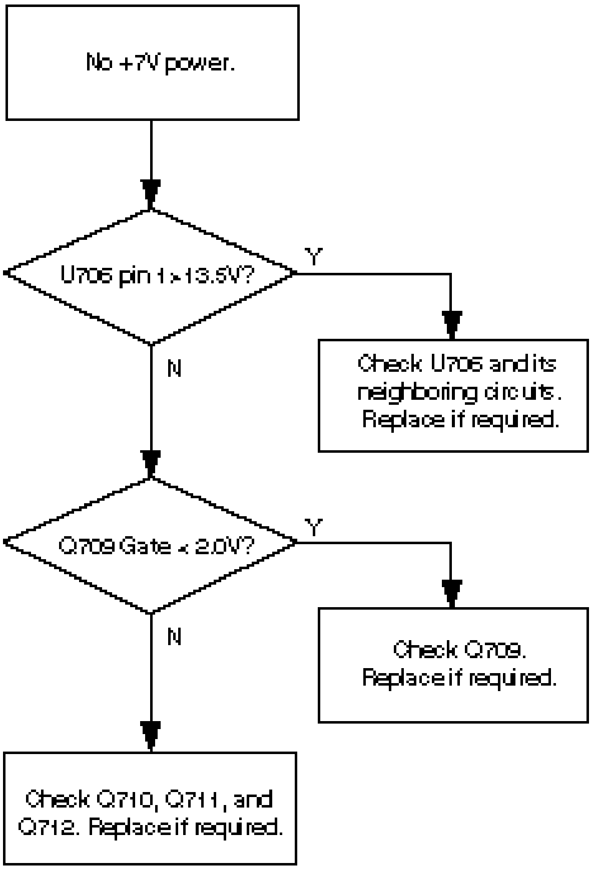
6-4 Hands-Free Car Kit

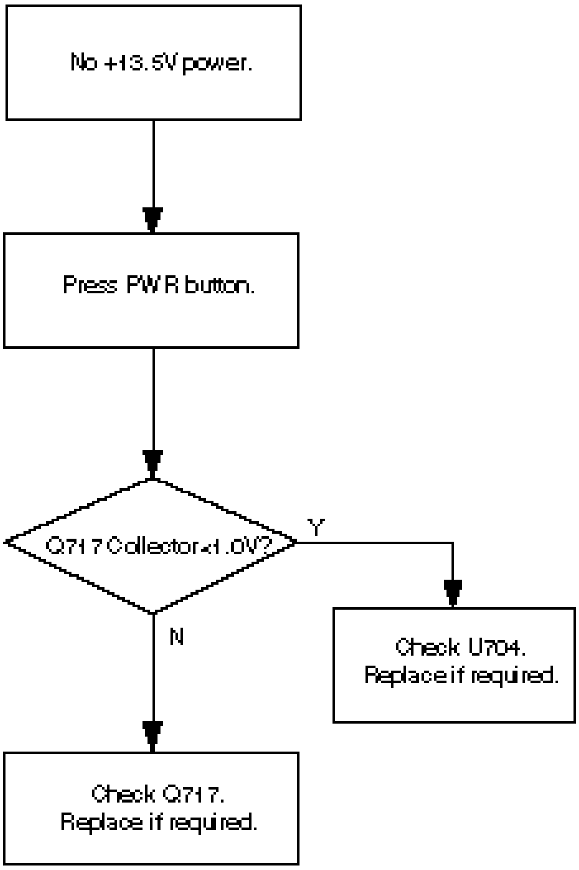
6-4-1 Abnormal Battery Charging

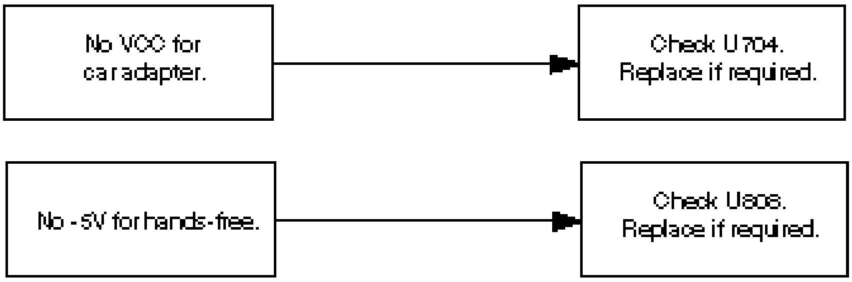


A: 2.47V °¬ V at U703 pin 1 < 2.98V
B: 1.53V °¬ V at U703 pin 1 < 2.47V

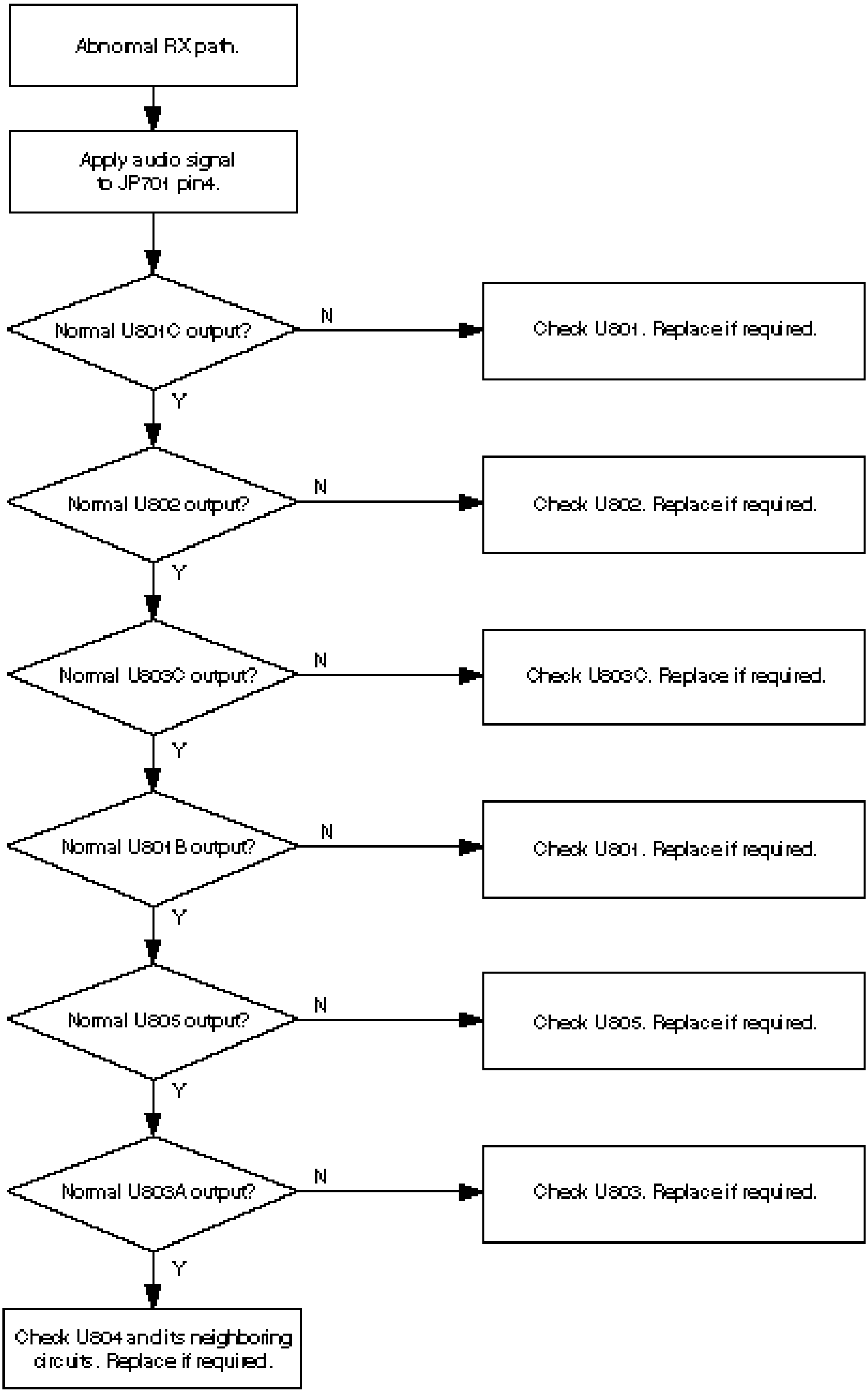
6-4-2 No Power (HHP PWR +5.8V, +13.5V) Supply



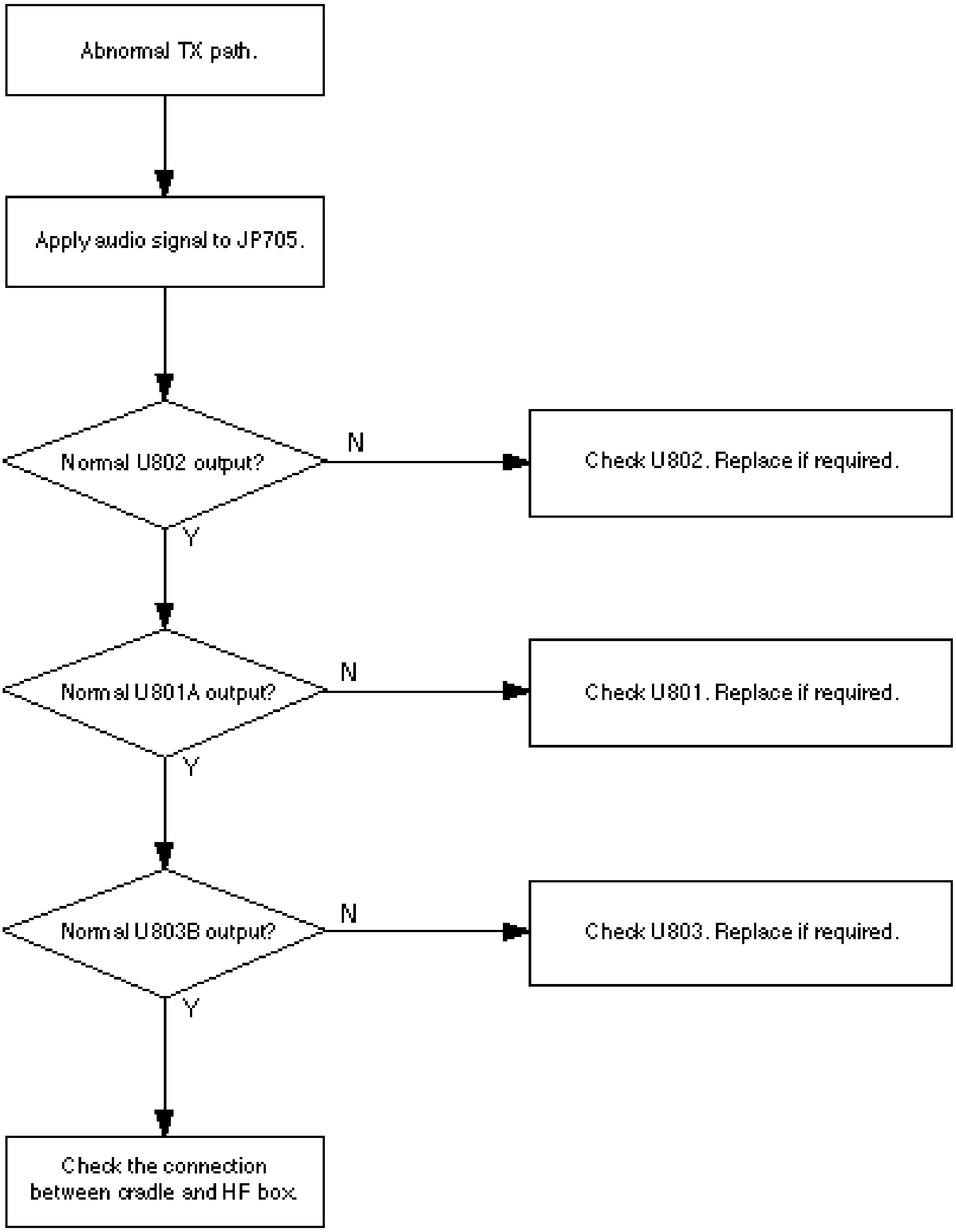




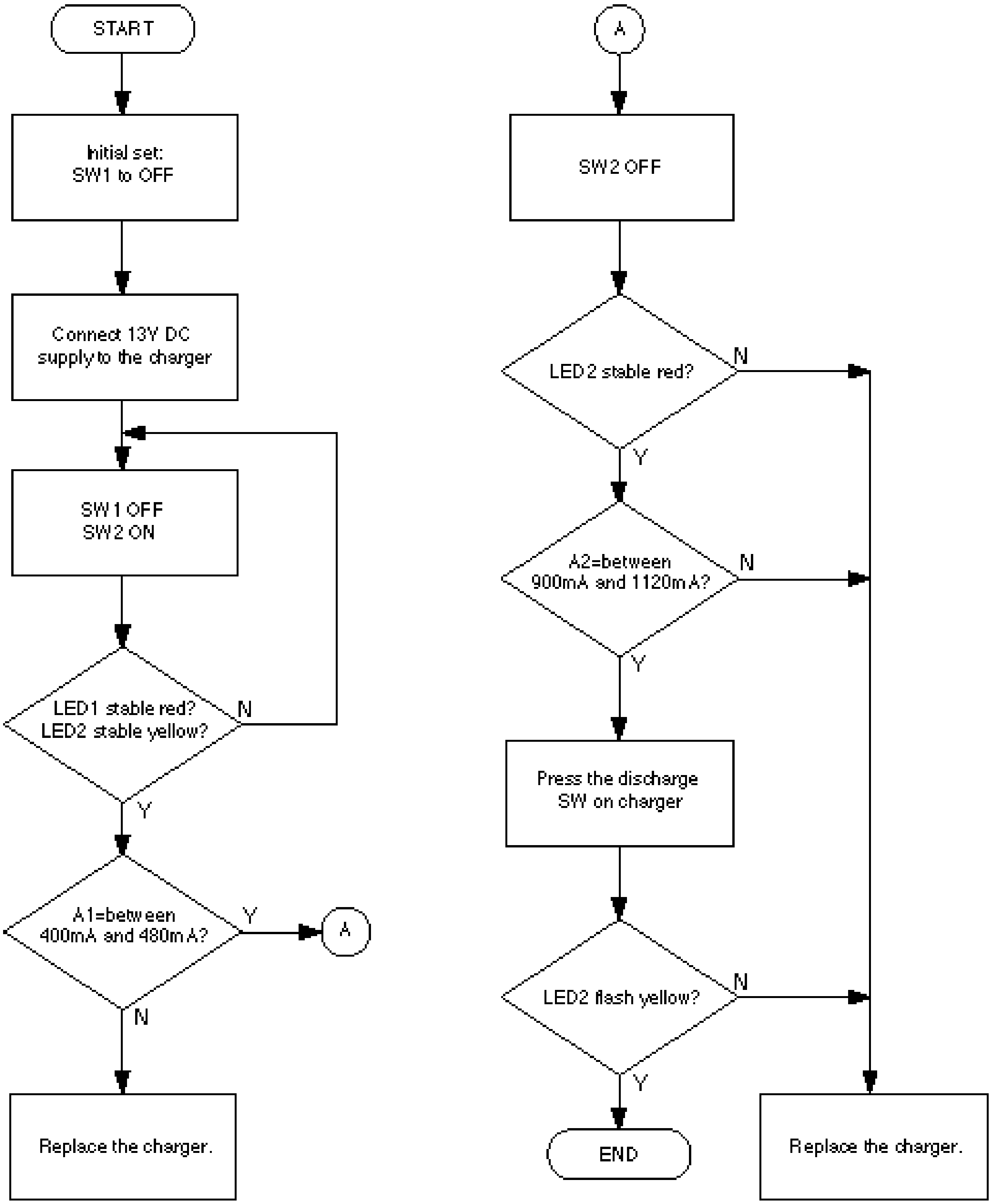
6-4-3 Hands-Free RX Path



6-4-4 Hands-Free TX Path

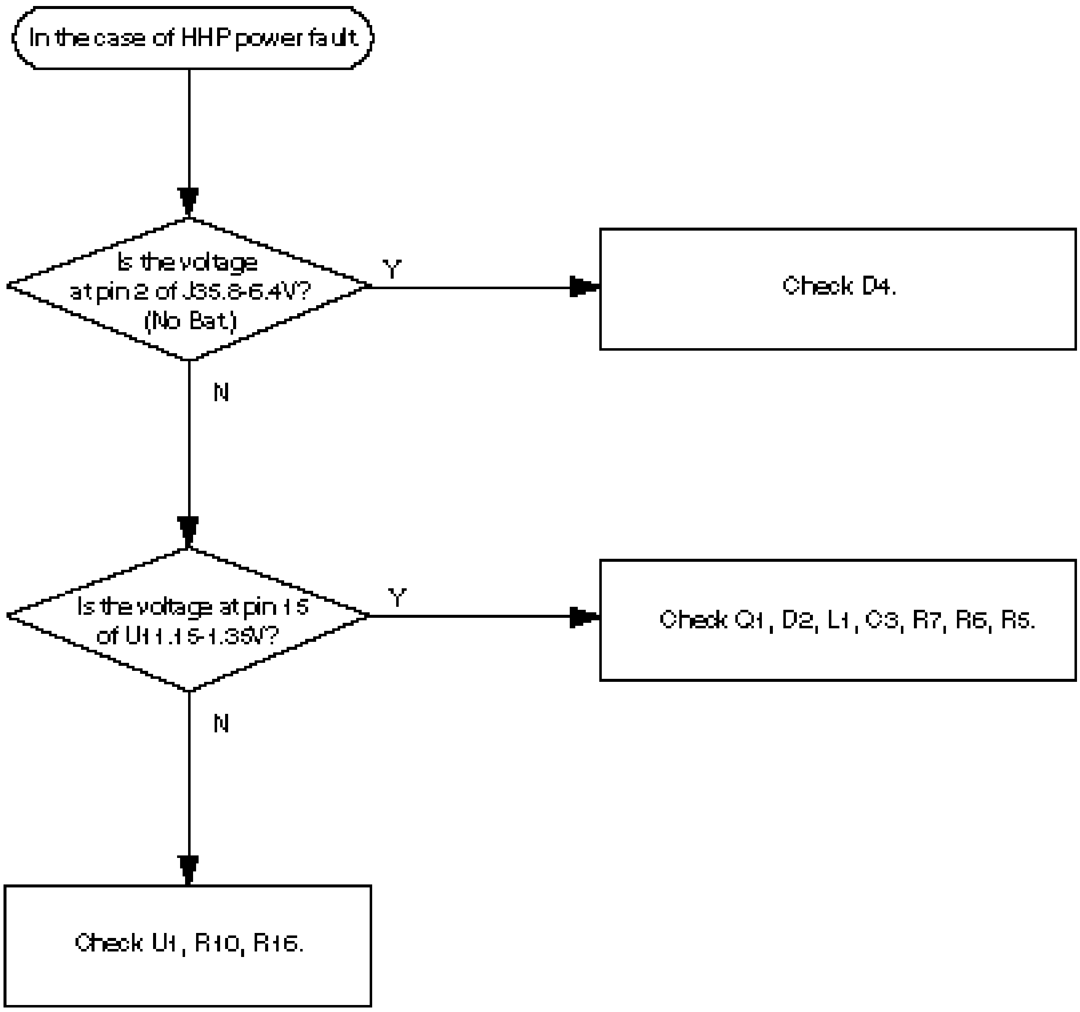


6-5 Desk-Top Rapid Charger

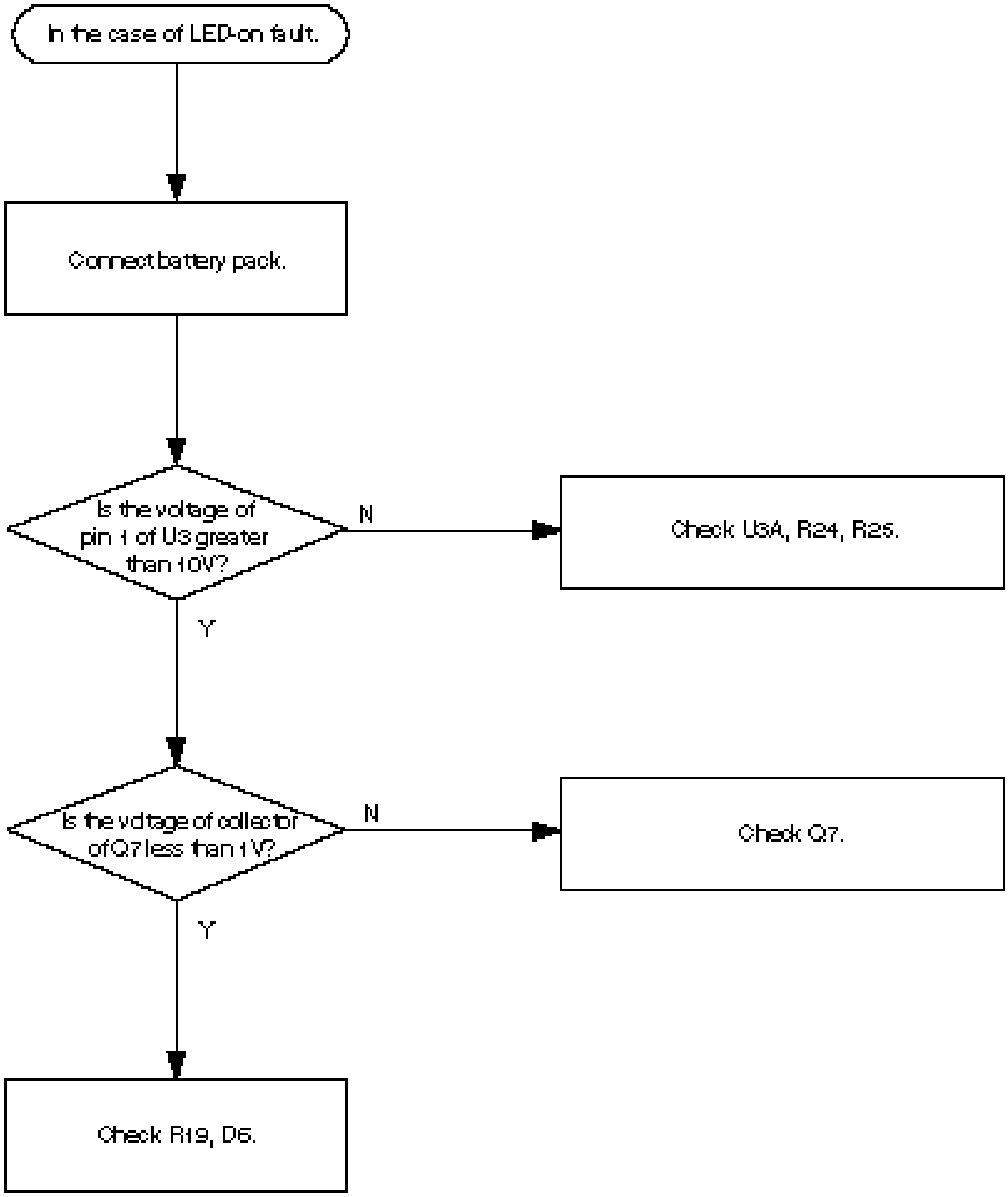


6-6 Cigarette Lighter Adapter

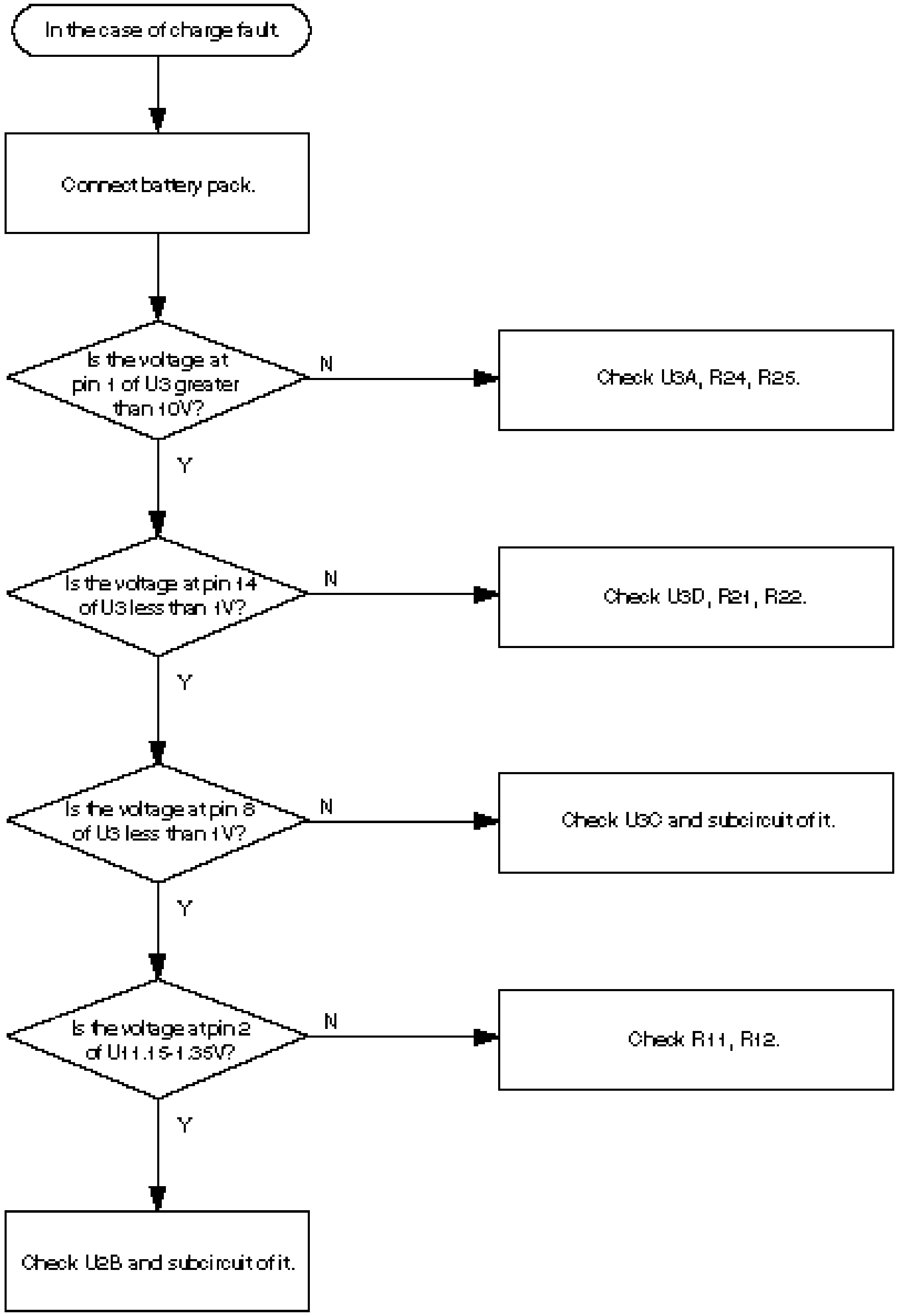
6-6-1 Power Fault



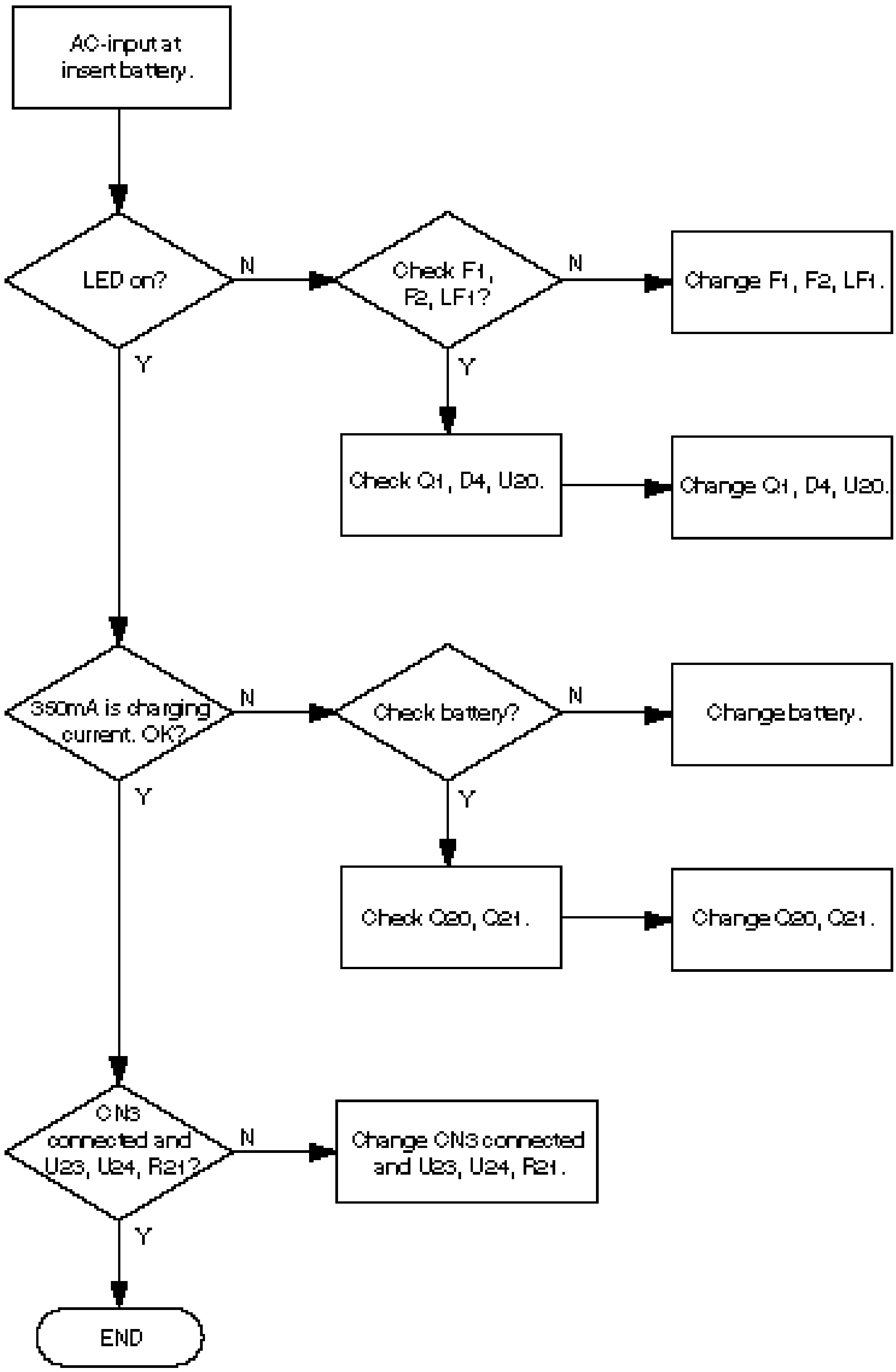
6-6-2 LED-On Fault



6-6-3 Charge Fault

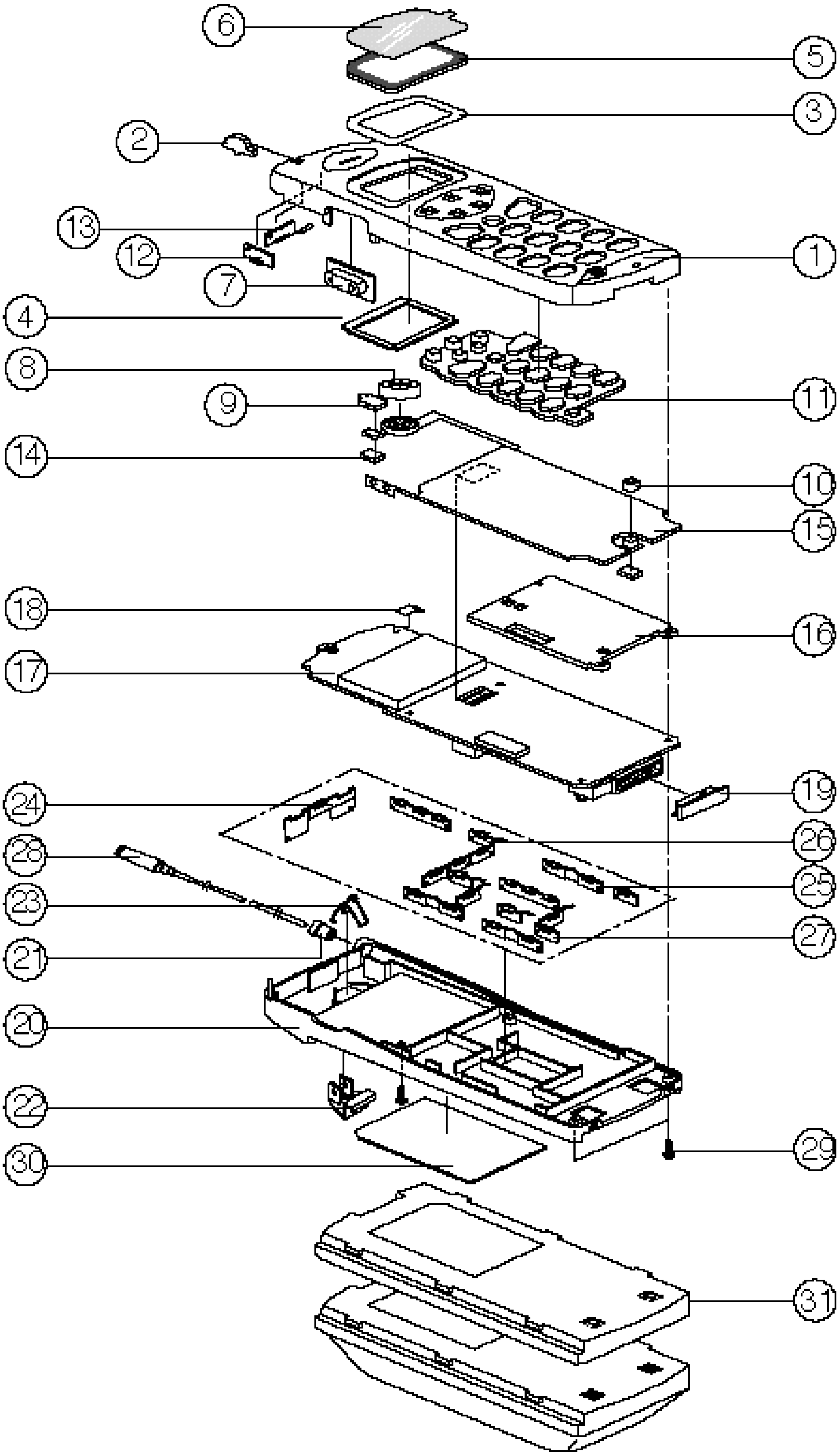


6-7 Travel Charger



7. Exploded View and its Parts List

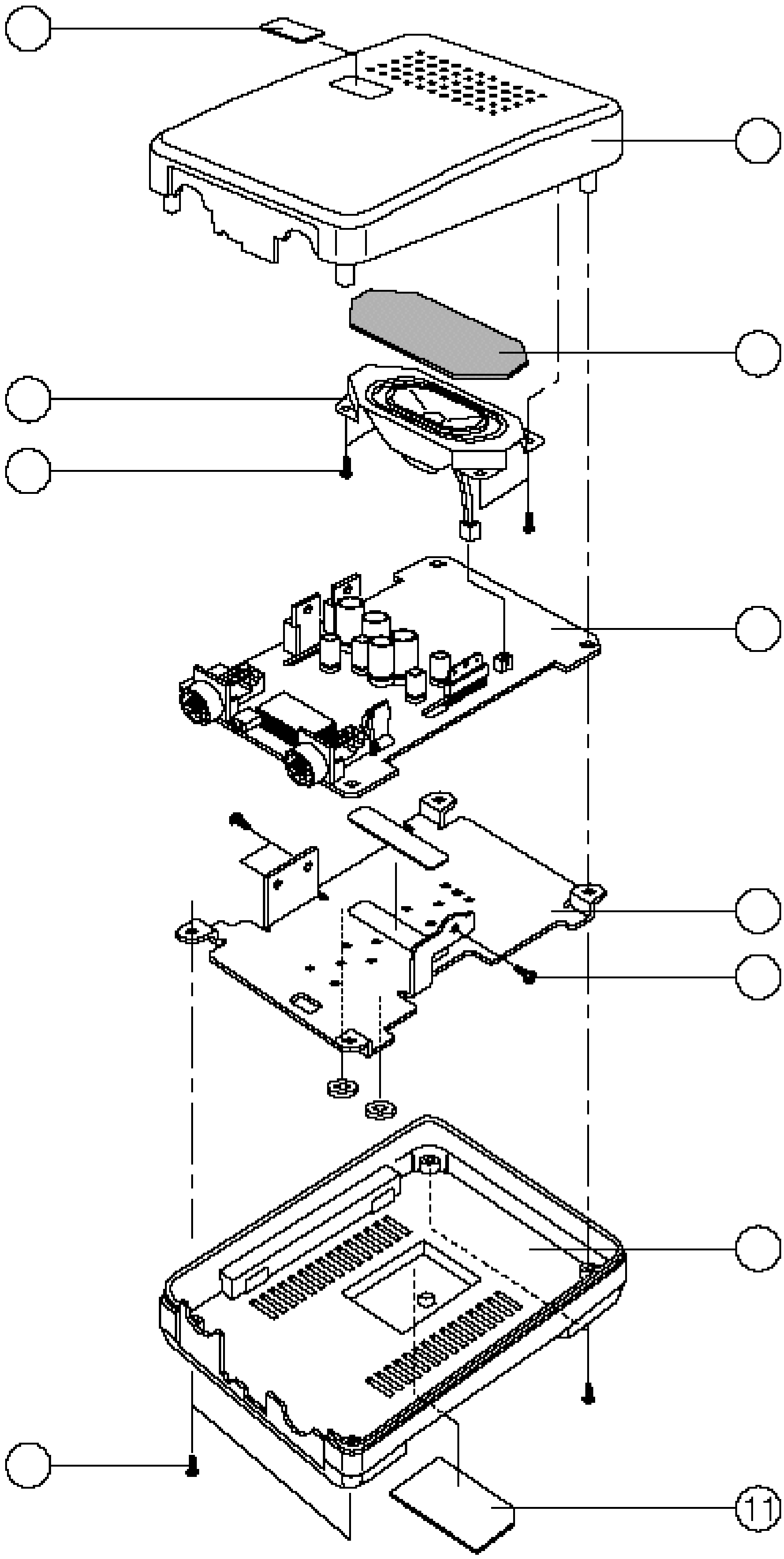
7-1 Main Set Exploded View



7-2 Main Set Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	FRONT-COVER	GH72-41044A	1	
2	CAP-LED	GH72-40008A	1	
3	TAPE-WINDOW	GH73-10002A	1	
4	SPONGE-LCD	GH73-10001B	1	
5	WINDOW-LCD	GH72-30003A	1	
6	TAPE WINDOW-BOHO	GH72-10001A	1	
7	KEY-VOLUME	GH73-40582A	1	
8	HOLDER-SPEAKER (or SPK)	GH73-40566A	1	
9	HOLDER-BUZZER	GH73-40581A	1	
10	HOLDER-MIC	GH73-40538A	1	
11	KEY-PAD (L)	GH73-40580A	1	
12	STRIP-FINGER (S)	GH71-10550A	1	
13	STRIP-FINGER (M)	GH71-10549A	1	
14	MPR-SPONGE	GH74-10565A	2	
15	KEY-PBA	GH96-00764A	1	
16	SHIELD-COVER (RF)	GH72-41034A	1	
17	MAIN-PBA	GH92-00683A	1	
18	SPRING-CONTACT	GH71-10004A	1	
19	COVER-CONNECTOR	GH73-40005A	1	
20	REAR-COVER	GH72-41043A	1	
21	BUSHING-ANT	GH71-40001A	1	
22	LOCKER-MAIN	GH64-30017A	1	
23	SPRING-LOCKER	GH61-70002A	1	
24	SHIELD FRAME	GH71-10003A	1	
25	STRIP-FINGER (L)	GH71-10548A	6	
26	STRIP-FINGER (M)	GH71-10549A	6	
27	STRIP-FINGER (S)	GH71-10550A	4	
28	ANTENNA	GH42-10504A	1	
29	SCREW	6001-000101	4	
30	LABEL (R)-ID MAIN	GH68-30901A	1	
31	STD BATT. PACK (850M)	GH43-10048A	1	

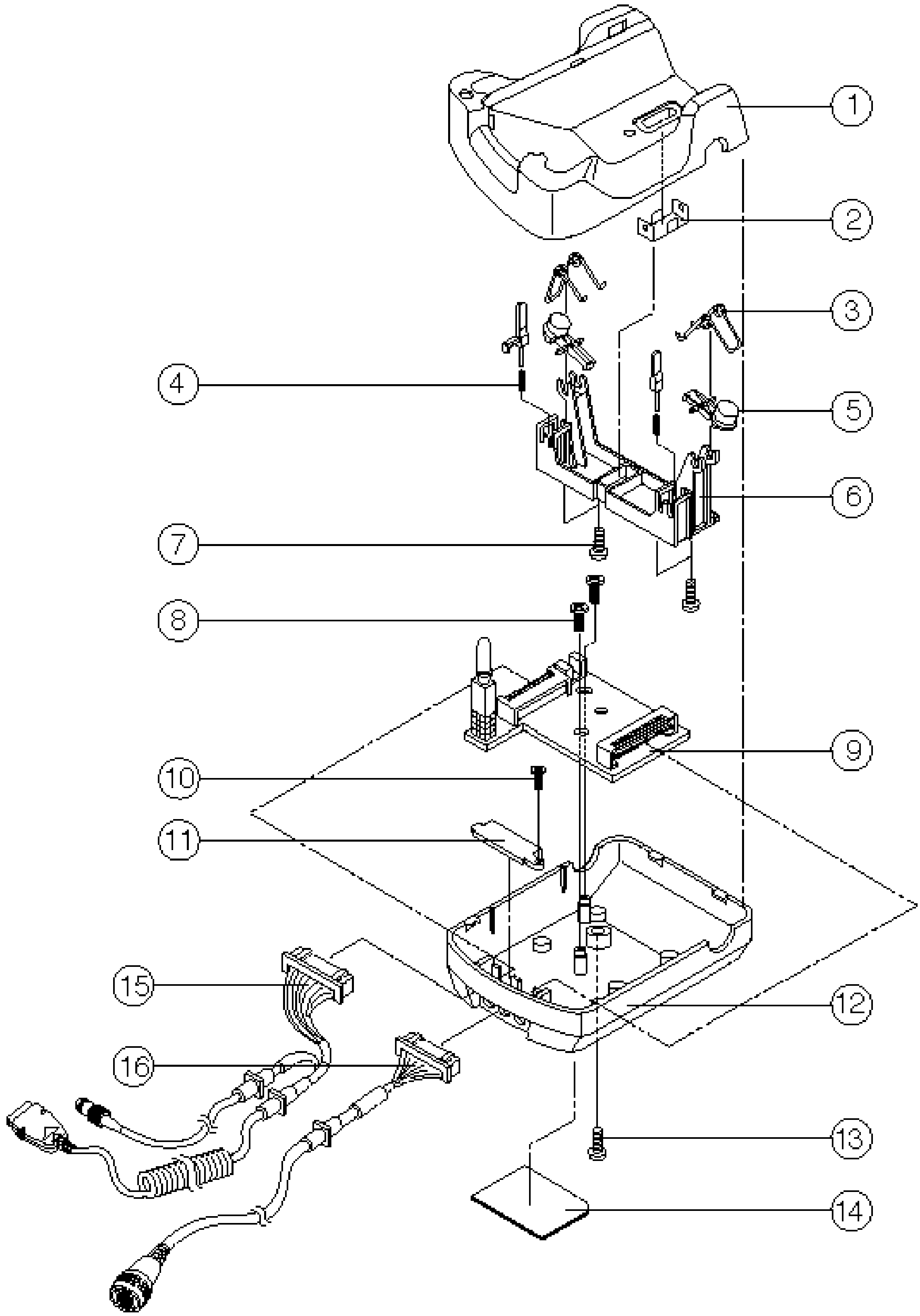
7-3 Hands-Free Kit Exploded View



7-4 Hands-Free Kit Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	H/F UPPER HOUSING	GH72-41045A	1	
2	LABEL (R)-LOGO H/F	GH68-30933A	1	
3	H/F FELT-SPEAKER	GH74-10521A	1	
4	AUDIO-SPEAKER	3001-000186	1	
5	SCREW	6003-000115	4	
6	H/F PBA		1	
7	HEATSINK-H/F	GH71-10559A	1	
8	SCREW	6003-000106	3	
9	H/F LOWER HOUSING	GH72-40626A	1	
10	SCREW	6003-000161	4	
11	LABEL (R)-ID H/F	GH68-30932A	1	

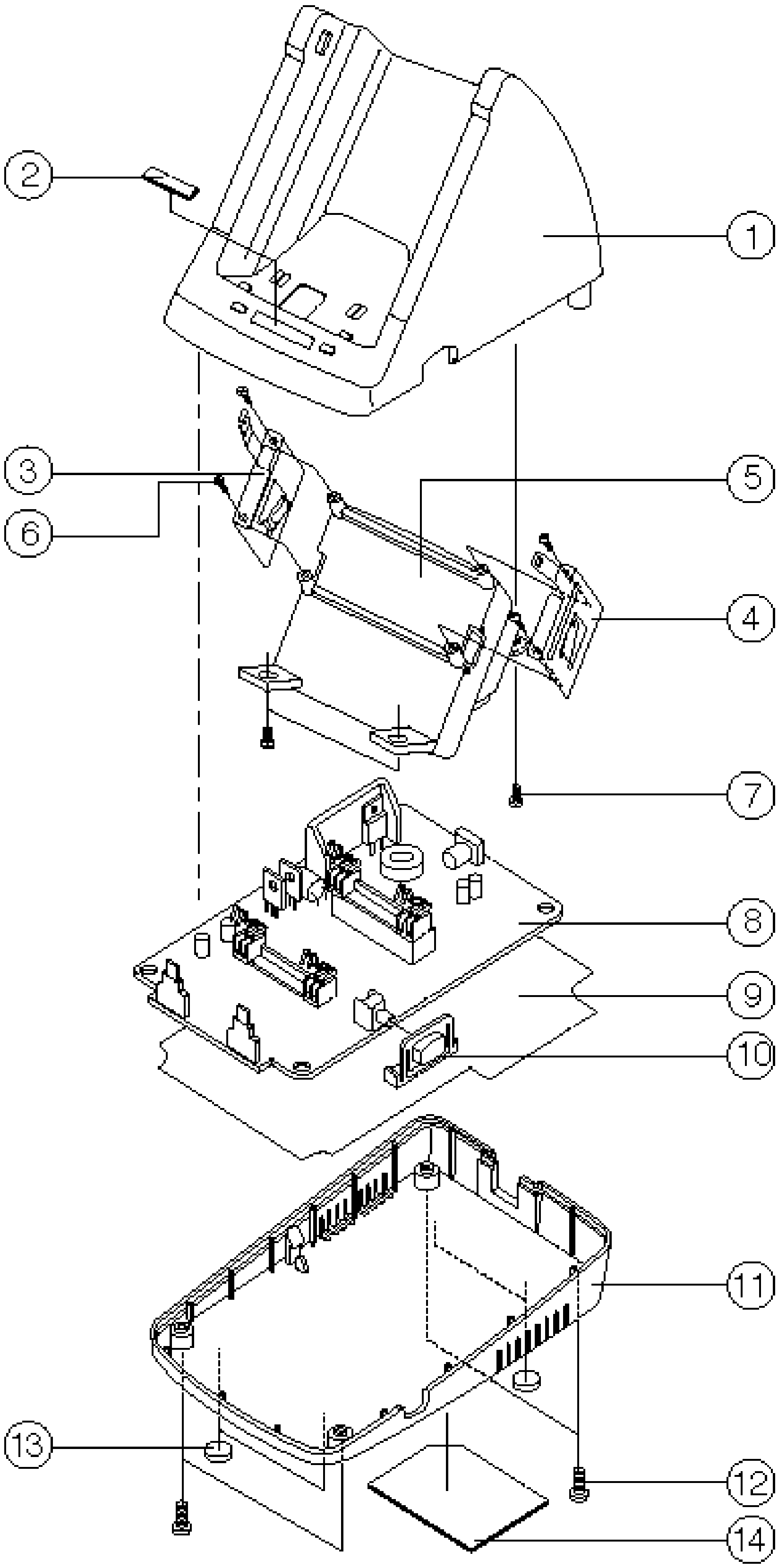
7-5 Hands-Free Kit Cradle Exploded View



7-6 Hands-Free Kit Cradle Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	UPPER HOUSING-C/D	GH72-40014A	1	
2	SOCKET PLATE-C/D	GH70-10526A	1	
3	TORSION SPRING-C/D	GH70-40002A	2	
4	EJECTOR SPRING-C/D	GH70-10520A	2	
5	LOCKER-C/D	GH72-40013A	2	
6	FRAME-C/D	GH72-40011A	1	
7	SCREW, TAPTITE, B, BH, M2.6, L6	6003-000107	4	
8	SCREW, TAPTITE, BH, M2.6, L6	6003-000107	2	
9	CRADLE-PBA		1	
10	SCREW, TAPPING, BH, M2, L6	6002-000342	4	
11	HOLDER-C/D	GH72-40622A	1	
12	LOWER HOUSING-C/D	GH72-40010A	1	
13	SCREW, MACHINE, BH, M3, L8	6001-000556	1	
14	LABEL (R)-ID C/D	GH68-30931A	1	
15	CURL CORD		1	
16	CRADLE DATA CABLE		1	

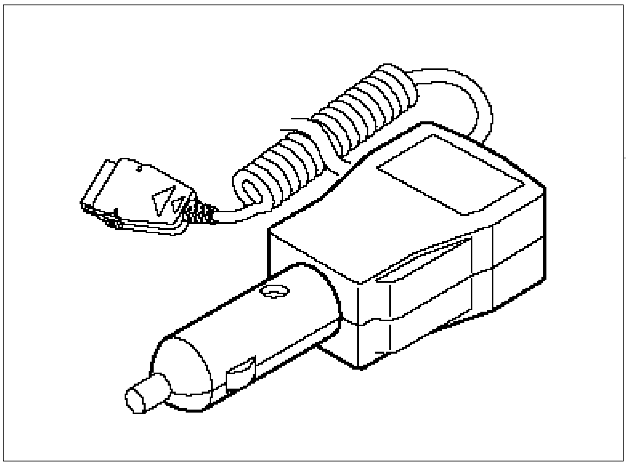
7-7 Desk-Top Rapid Charger Exploded View



7-8 Desk-Top Rapid Charger Parts List

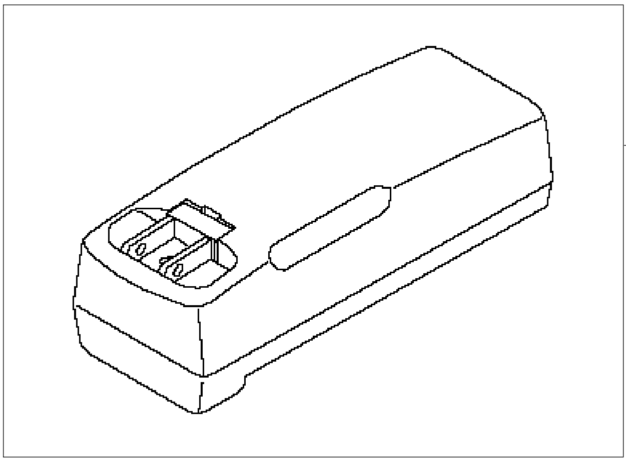
NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	CASE TOP		1	
2	LABEL-LOGO DTC		1	
3	HOOK PLATE (L)		1	
4	HOOK PLATE (R)		1	
5	HOUSING BATT		1	
6	TAPPING SCREW		4	
7	TAPPING SCREW	GH90-00611A	2	
8	MAIN PBA		1	
9	INSULATION PAPER		1	
10	KNOB		1	
11	CASE BOTTOM		1	
12	TAPPING SCREW		4	
13	FOOT RUBBER		4	
14	LABEL-DTC		1	

7-9 Cigarette Lighter Adapter



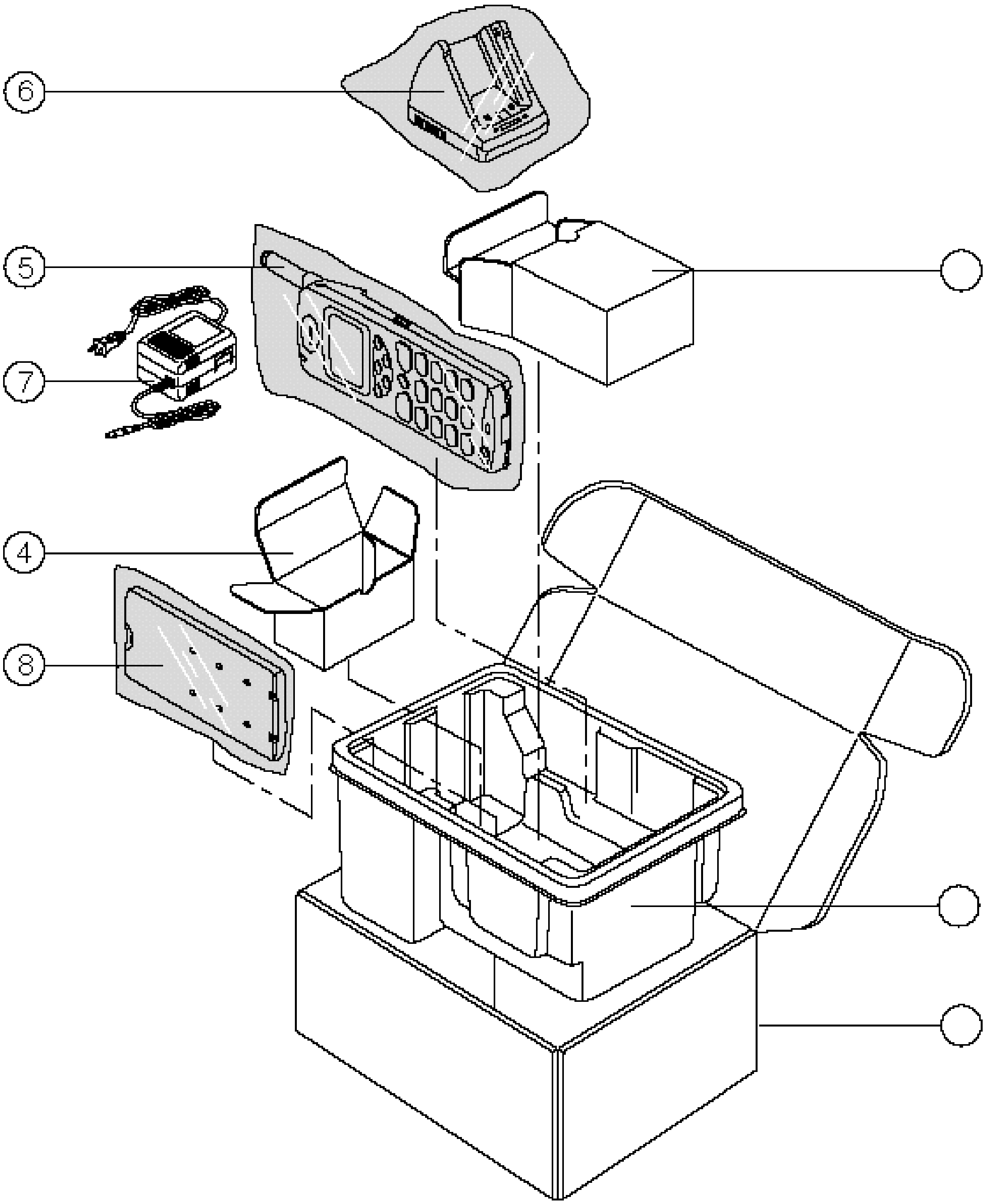
CIGARETTE LIGHTER ADAPTER ASS'Y : GH44-40012A

7-10 Travel Charger



TRAVEL CHARGER ASS'Y : GH44-40011A

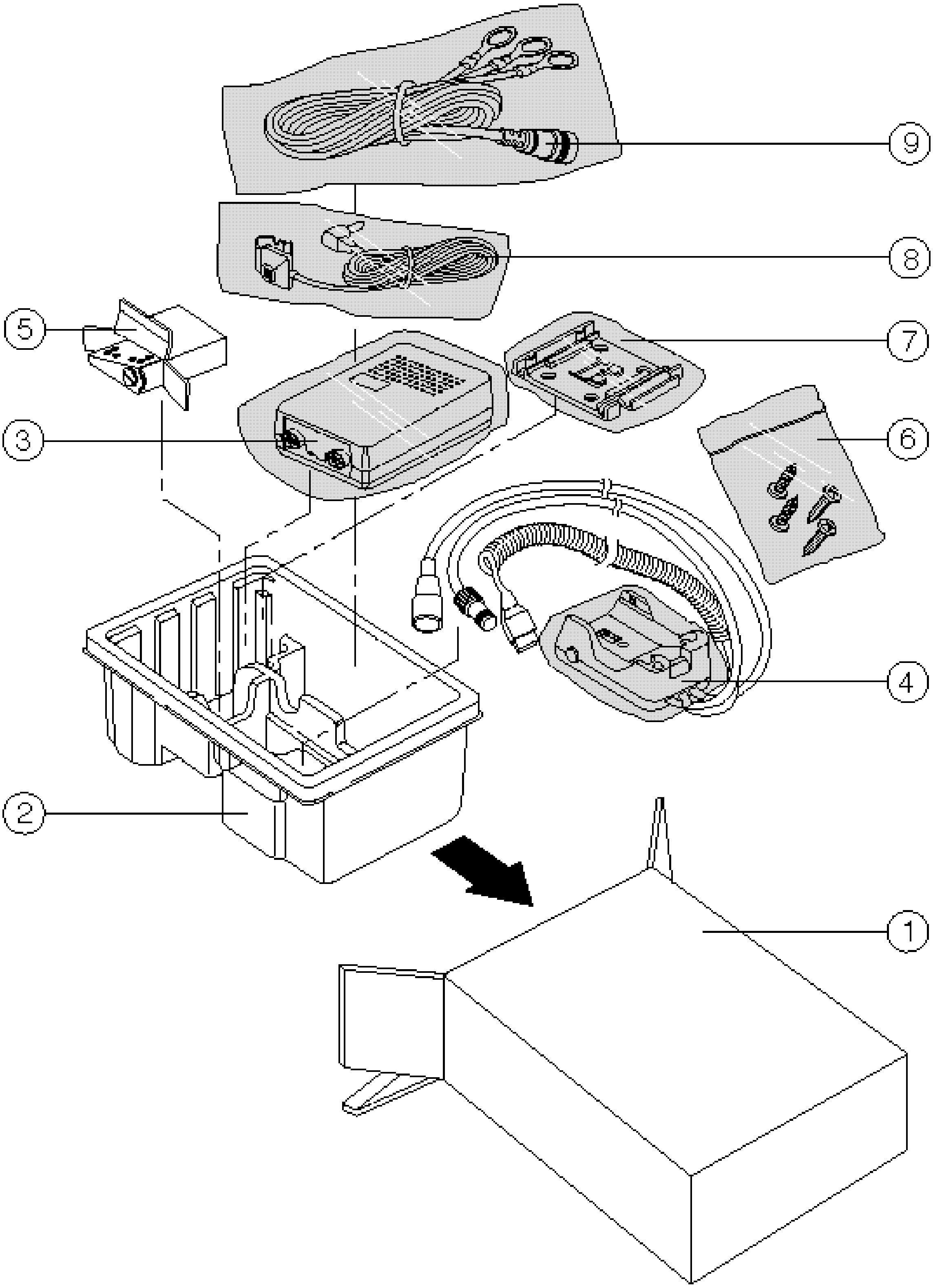
7-11 Main Set Packing Layout



7-12 Main Set Packing Parts List

NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	GIFT BOX MAIN	GH69-10884A	1	
2	CUSHION CASE-MAIN	GH69-20558A	1	
3	GIFT BOX-DTC	GH69-10885A	1	
4	GIFT BOX-ADAPTER	GH69-10886A	1	
5	MAIN SET		1	
6	DESK TOP CHARGER	GH90-00611A	1	
7	AC ADAPTER	GH44-30526A	1	
8	STD BATT. PACK	GH43-10048A	1	

7-13 Hands-Free Kit Packing Layout



7-14 Hands-Free Kit Packing Parts List

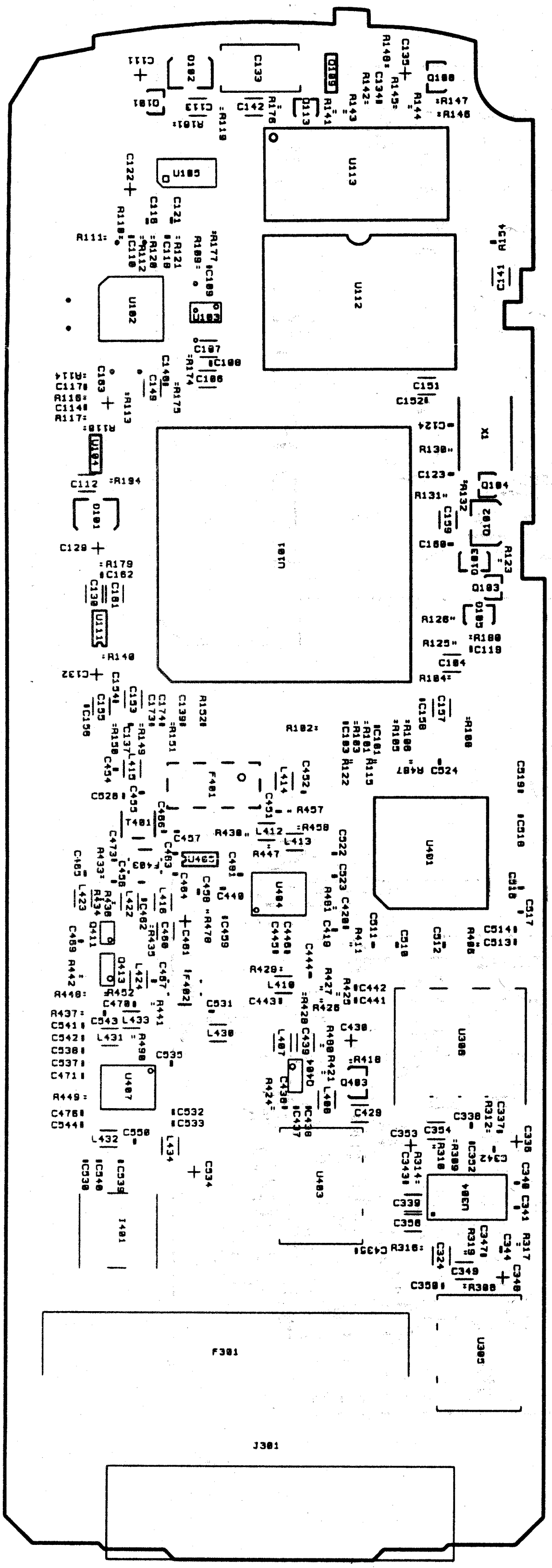
NO	DESCRIPTION	SEC. CODE	Q'TY	REMARK
1	GIFT BOX-H/F	GH69-10887A	1	
2	CUSHION CASE-H/K	GH69-20559A	1	
3	H/F BOX		1	
4	CRADLE		1	
5	CLAM SHELL MOUNT	GH75-10550A	1	
6	SUA INSTALL SCREW	GH75-10552A	1	
7	MTG BRACKET-H/F	GH72-40628A	1	
8	H/F MIC ASS'Y	GH96-000736A	1	
9	PWR-CABLE	GH39-10503A	1	

MEMO

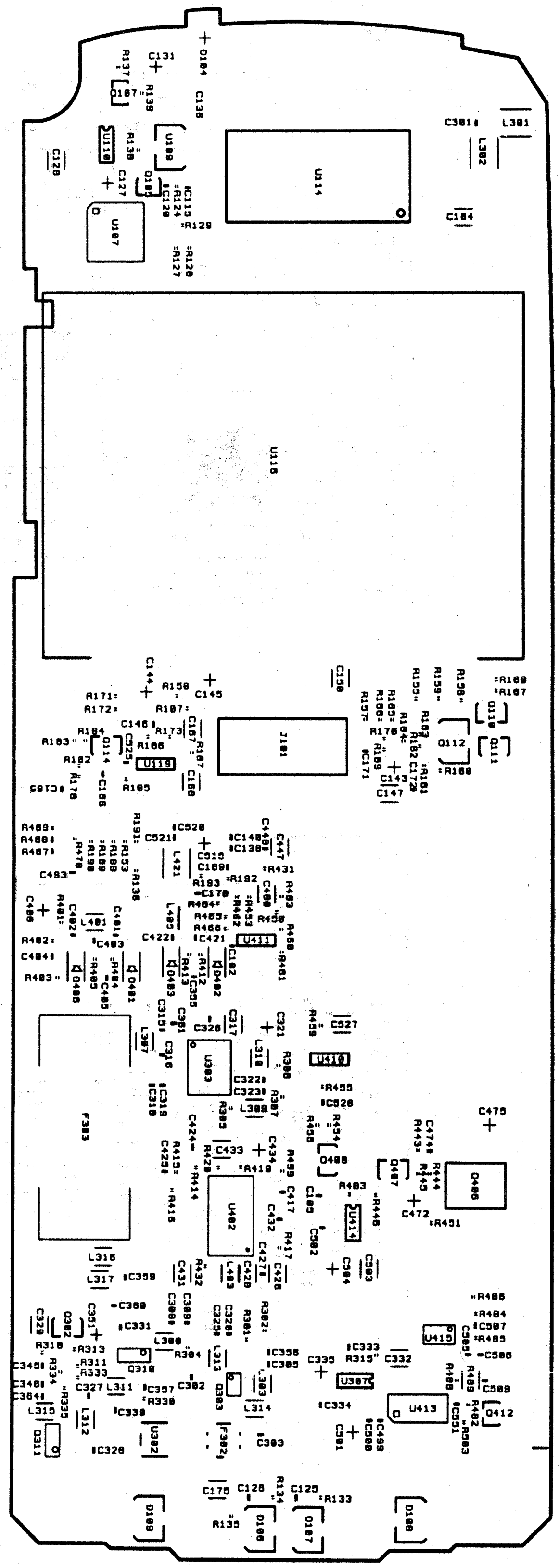
8. PCB Diagrams

8-1 Main

Top View

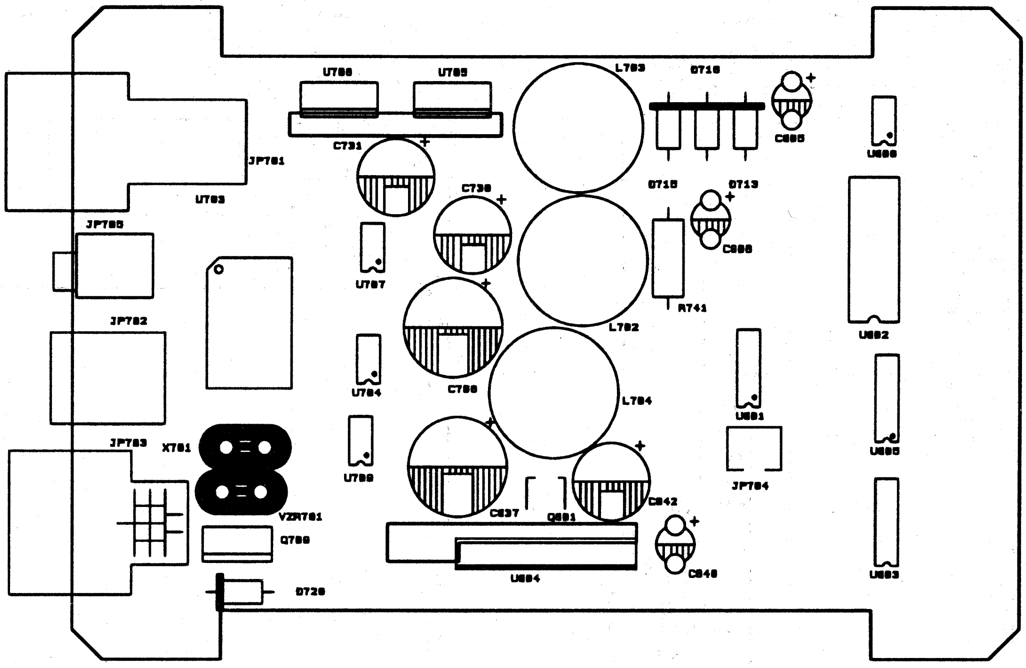


Bottom View

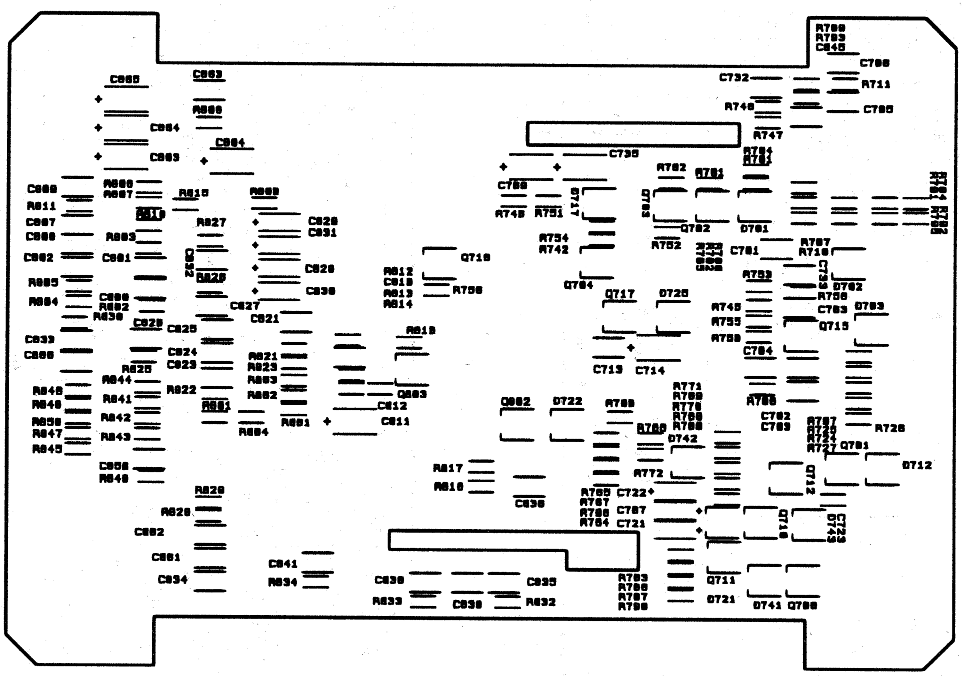


8-2 Hands-Free Car Kit

Top View

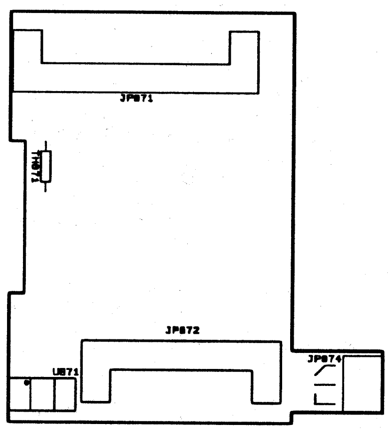


Bottom View

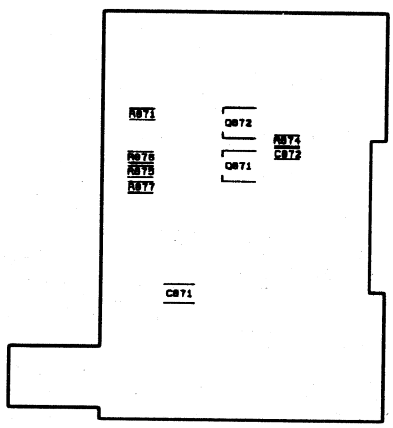


8-3 Cradle

Top View

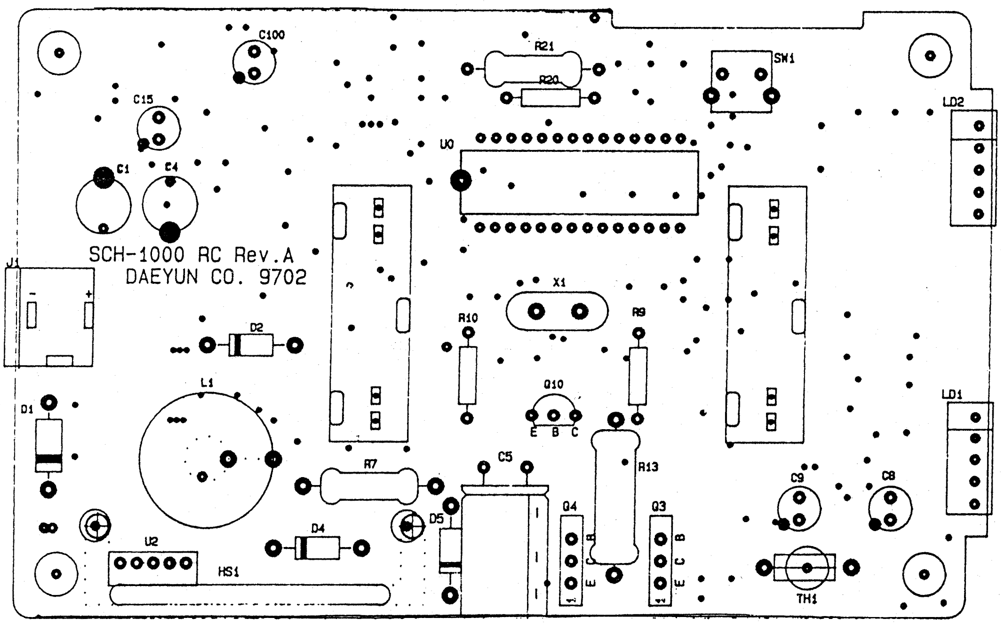


Bottom View

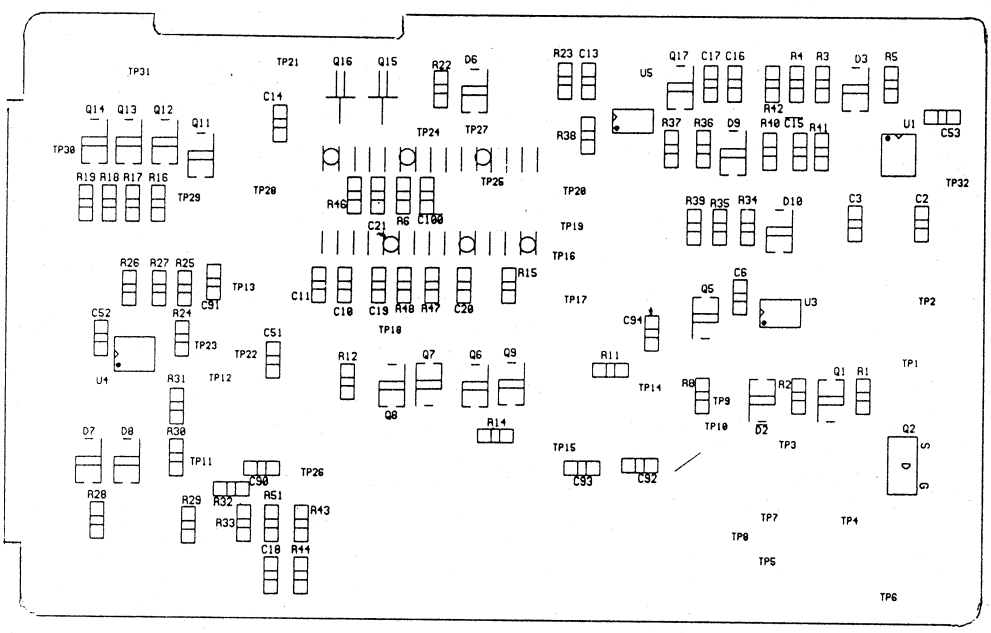


8-4 Desk-Top Rapid Charger

Top View

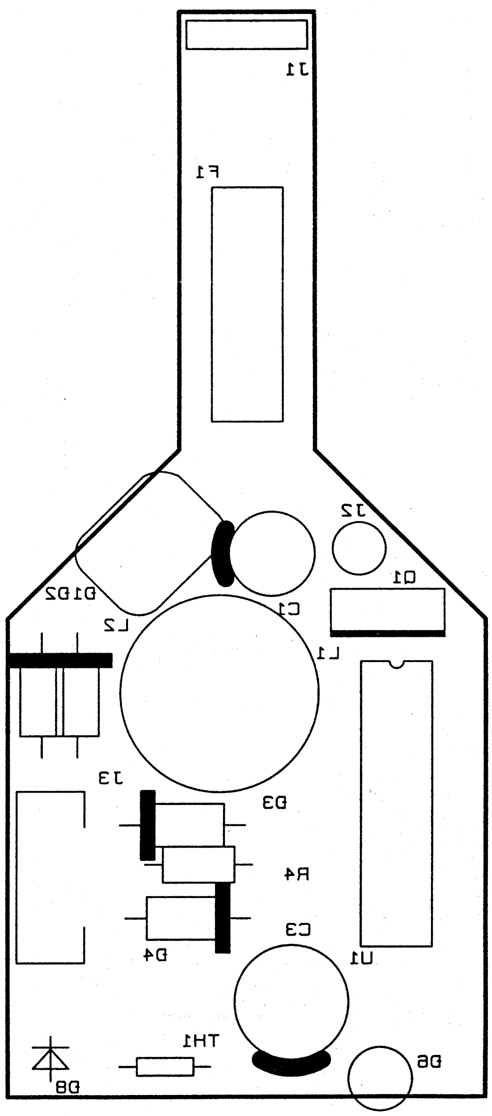


Bottom View

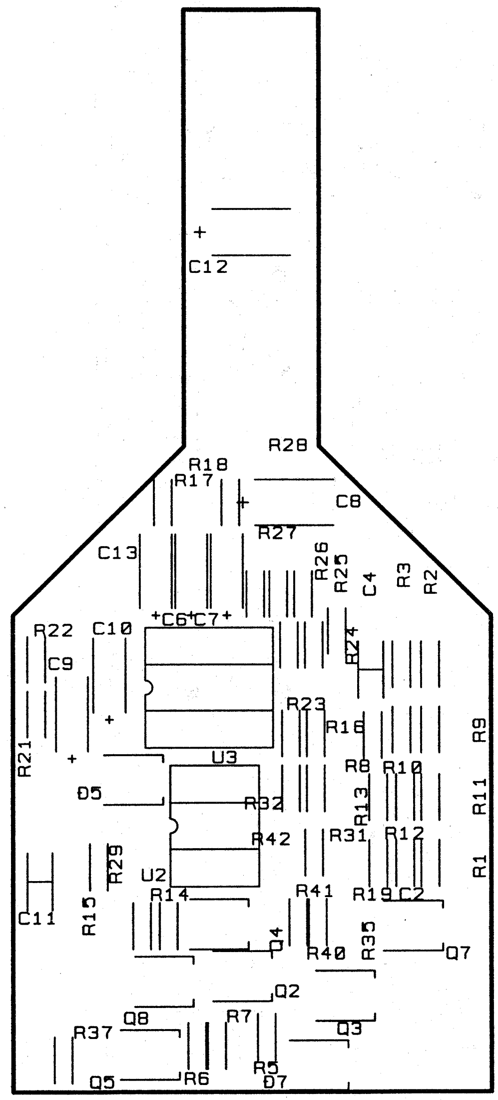


8-5 Cigarette Lighter Adapter

Top View

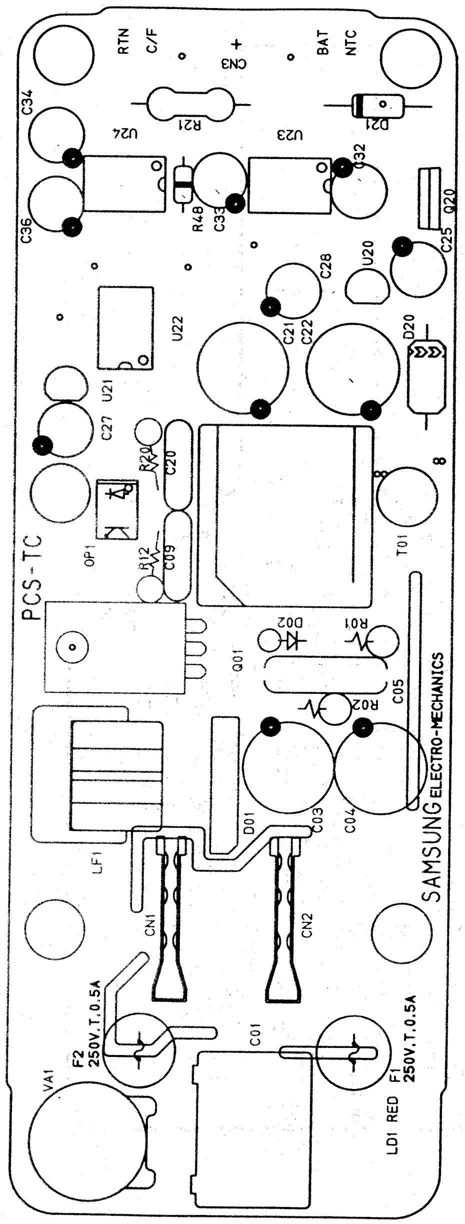


Bottom View

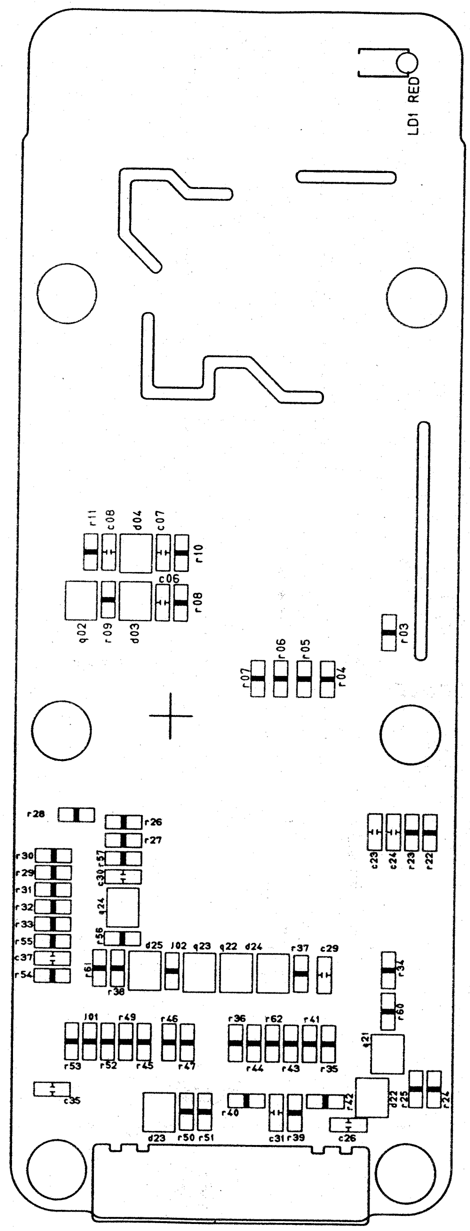


8-6 Travel Charger

Top View



Bottom View



9. Electrical Parts List

9-1 Handset

NO	DESCRIPTION	SEC. CODE	REMARK
	- Capacitors -		
C101	Ceramic, Chip, 47nF	2203-001432	
C102	Ceramic, Chip, 33nF	2203-001416	
C104	Ceramic, Chip, 100nF	2203-000178	
C105	Ceramic, Chip, 8.2nF	2203-001210	
C106, C107	Ceramic, Chip, 100nF	2203-000178	
C108	Ceramic, Chip, 680F	2203-001124	
C109	Ceramic, Chip, 390pF	2203-000836	
C110	Ceramic, Chip, 3.9nF	2203-000726	
C111	Tantalum, Chip, 1uF	2404-000151	
C112, C113	Ceramic, Chip, 100nF	2203-000178	
C114	Ceramic, Chip, 1nF	2203-000438	
C115	Ceramic, Chip, 5.6nF	2203-001033	
C116	Ceramic, Chip, 10nF	2203-000254	
C117	Ceramic, Chip, 47nF	2203-001432	
C118	Ceramic, Chip, 390pF	2203-000836	
C119	Ceramic, Chip, 100nF	2203-000178	
C120	Ceramic, Chip, 22nF	2203-000604	
C121	Ceramic, Chip, 2.2nF	2203-000489	
C122	Tantalum, Chip, 2.2uF	2404-000175	
C123, C124	Ceramic, Chip, 5pF	2203-001437	
C125, C126	Ceramic, Chip, 470pF	2203-000940	
C127	Tantalum, Chip, 10uF	2404-000139	
C128	Ceramic, Chip, 100nF	2203-000178	
C129	Tantalum, Chip, 10uF	2404-000139	
C130	Ceramic, Chip, 100nF	2203-000178	
C133	Tantalum, Chip, 100uF	2404-000112	
C134	Ceramic, Chip, 1nF	2203-000438	
C137-C140	Ceramic, Chip, 8.2nF	2203-001210	
C141, C142	Ceramic, Chip, 100nF	2203-000178	
C143-C145	Tantalum, Chip, 4.7uF	2404-000232	
C146	Ceramic, Chip, 10nF	2203-000254	
C147	Ceramic, Chip, 100nF	2203-000178	

NO	DESCRIPTION	SEC. CODE	REMARK
C148	Ceramic, Chip, 10nF	2203-000254	
C149-C151	Ceramic, Chip, 100nF	2203-000178	
C152	Ceramic, Chip, 10nF	2203-000254	
C153	Ceramic, Chip, 100nF	2203-000178	
C154	Ceramic, Chip, 10nF	2203-000254	
C155	Ceramic, Chip, 100nF	2203-000178	
C156	Ceramic, Chip, 10nF	2203-000254	
C157	Ceramic, Chip, 100nF	2203-000178	
C158	Ceramic, Chip, 10nF	2203-000254	
C159	Ceramic, Chip, 100nF	2203-000178	
C160	Ceramic, Chip, 10nF	2203-000254	
C161	Ceramic, Chip, 100nF	2203-000178	
C162	Ceramic, Chip, 10nF	2203-000254	
C163	Tantalum, Chip, 1uF	2404-000151	
C164	Ceramic, Chip, 100nF	2203-000178	
C165	Chip, 0ohm, 5%	2007-000171	
C301	Ceramic, Chip, 1pF	2203-000466	
C302	Ceramic, Chip, 2pF	2203-000696	
C303	Ceramic, Chip, 8pF	2203-000870	
C305	Ceramic, Chip, 2.7nF	2203-000531	
C308	Ceramic, Chip, 1nF	2203-000438	
C309	Ceramic, Chip, 10nF	2203-000254	
C315	Ceramic, Chip, 47pF	2203-000995	
C316	Ceramic, Chip, 10nF	2203-000254	
C317	Ceramic, Chip, 100nF	2203-000178	
C318, C319	Ceramic, Chip, 10nF	2203-000254	
C320	Ceramic, Chip, 2.7nF	2203-000531	
C321	Tantalum, Chip, 4.7uF	2404-000232	
C322, C323	Ceramic, Chip, 1nF	2203-000438	
C324	Ceramic, Chip, 100nF	2203-000178	
C325	Ceramic, Chip, 2.7nF	2203-000531	
C326	Ceramic, Chip, 47nF	2203-001432	
C327	Ceramic, Chip, 1nF	2203-000438	
C328	Ceramic, Chip, 2pF	2203-000696	
C329	Ceramic, Chip, 100nF	2203-000178	
C330	Ceramic, Chip, 12pF	2203-000330	
C331	Ceramic, Chip, 15pF	2203-000386	
C332	Ceramic, Chip, 100nF	2203-000178	

NO	DESCRIPTION	SEC. CODE	REMARK
C333, C334	Ceramic, Chip, 10nF	2203-000254	
C335, C336	Tantalum, Chip, 10uF	2404-000139	
C337, C338	Ceramic, Chip, 10nF	2203-000254	
C339	Ceramic, Chip, 100nF	2203-000178	
C340-C342	Ceramic, Chip, 100pF	2203-000233	
C343	Ceramic, Chip, 10nF	2203-000254	
C344	Ceramic, Chip, 100pF	2203-000233	
C345	Ceramic, Chip, 10pF	2203-000278	
C346	Ceramic, Chip, 1nF	2203-000438	
C347	Ceramic, Chip, 100pF	2203-000233	
C348	Tantalum, Chip, 1.5uF	2404-000274	
C349	Ceramic, Chip, 100nF	2203-000178	
C350	Ceramic, Chip, 2.2nF	2203-000489	
C351	Tantalum, Chip, 10uF	2404-000139	
C352	Ceramic, Chip, 100pF	2203-000233	
C353	Tantalum, Chip, 1.5uF	2404-000274	
C354	Ceramic, Chip, 100nF	2203-000178	
C356	Ceramic, Chip, 2.7nF	2203-000531	
C357	Ceramic, Chip, 10nF	2203-000254	
C358	Ceramic, Chip, 100nF	2203-000178	
C359	Ceramic, Chip, 75pF	2203-001441	
C360	Ceramic, Chip, 10nF	2203-000254	
C361	Ceramic, Chip, 15pF	2203-000386	
C364	Ceramic, Chip, 1pF	2203-000466	
C401, C402	Ceramic, Chip, 100pF	2203-000233	
C403	Ceramic, Chip, 6pF	2203-001180	
C404	Ceramic, Chip, 47nF	2203-001432	
C405	Ceramic, Chip, 1nF	2203-000438	
C406	Tantalum, Chip, 2.2uF	2404-000167	
C417	Ceramic, Chip, 100pF	2203-000233	
C420	Ceramic, Chip, 100pF	2203-000233	
C421, C422	Ceramic, Chip, 56pF	2203-001072	
C424, C425	Ceramic, Chip, 100pF	2203-000233	
C426	Ceramic, Chip, 100nF	2203-000178	
C427	Ceramic, Chip, 1nF	2203-000438	
C428, C429	Ceramic, Chip, 100nF	2203-000178	
C430	Tantalum, Chip, 10uF	2404-000139	

NO	DESCRIPTION	SEC. CODE	REMARK
C431	Ceramic, Chip, 100nF	2203-000178	
C432	Ceramic, Chip, 100pF	2203-000233	
C433	Ceramic, Chip, 100nF	2203-000178	
C434	Tantalum, Chip, 1.5uF	2404-000274	
C435	Ceramic, Chip, 2.2nF	2203-000489	
C436, C437	Ceramic, Chip, 10pF	2203-000278	
C439	Ceramic, Chip, 100nF	2203-000178	
C440	Ceramic, Chip, 1.5pF	2203-001385	
C441, C442	Ceramic, Chip, 1nF	2203-000438	
C443, C444	Ceramic, Chip, 5pF	2203-001437	
C445, C446	Ceramic, Chip, 10pF	2203-000278	
C447	Ceramic, Chip, 100nF	2203-000178	
C448	Ceramic, Chip, 1nF	2203-000438	
C451, C452	Ceramic, Chip, 1nF	2203-000438	
C454, C455	Ceramic, Chip, 24pF	2203-000643	
C456	Ceramic, Chip, 4pF	2203-001017	
C457	Ceramic, Chip, 1nF	2203-000438	
C458	Ceramic, Chip, 100pF	2203-000233	
C459	Ceramic, Chip, 1nF	2203-000438	
C460	Ceramic, Chip, 100nF	2203-000178	
C461	Tantalum, Chip, 10uF	2404-000139	
C463	Ceramic, Chip, 2pF	2203-000696	
C464, C465	Ceramic, Chip, 1nF	2203-000438	
C467	Ceramic, Chip, 2pF	2203-000696	
C469	Ceramic, Chip, 1pF	2203-000466	
C470	Ceramic, Chip, 1nF	2203-000438	
C471	Ceramic, Chip, 100pF	2203-000233	
C472	Ceramic, Chip, 100nF	2203-000204	
C473	Ceramic, Chip, 15pF	2203-000386	
C474	Ceramic, Chip, 10nF	2203-000254	
C475	Tantalum, Chip, 4.7uF	2404-000232	
C476	Ceramic, Chip, 220pF	2203-000585	
C480	Ceramic, Chip, 100nF	2203-000178	
C481	Ceramic, Chip, 220pF	2203-000585	
C493	Ceramic, Chip, 100pF	2203-000233	
C499, C500	Ceramic, Chip, 10nF	2203-000254	
C501	Tantalum, Chip, 10uF	2404-000139	

NO	DESCRIPTION	SEC. CODE	REMARK
C502	Ceramic, Chip, 10nF	2203-000254	
C503	Ceramic, Chip, 100nF	2203-000178	
C504	Tantalum, Chip, 10uF	2404-000139	
C505	Ceramic, Chip, 100pF	2203-000233	
C506	Ceramic, Chip, 10nF	2203-000254	
C509	Ceramic, Chip, 100pF	2203-000233	
C510	Ceramic, Chip, 10nF	2203-000254	
C511	Ceramic, Chip, 1nF	2203-000438	
C512, C513	Ceramic, Chip, 10nF	2203-000254	
C514	Ceramic, Chip, 1nF	2203-000438	
C515	Tantalum, Chip, 10uF	2404-000139	
C516	Ceramic, Chip, 10nF	2203-000254	
C517	Ceramic, Chip, 1nF	2203-000438	
C518	Ceramic, Chip, 10nF	2203-000254	
C519	Ceramic, Chip, 1nF	2203-000438	
C520	Ceramic, Chip, 10nF	2203-000254	
C521	Ceramic, Chip, 1nF	2203-000438	
C522	Ceramic, Chip, 10nF	2203-000254	
C523	Ceramic, Chip, 1nF	2203-000438	
C524	Ceramic, Chip, 10nF	2203-000254	
C525	Ceramic, Chip, 1nF	2203-000438	
C526	Ceramic, Chip, 47nF	2203-001432	
C527	Ceramic, Chip, 100nF	2203-000178	
C530	Ceramic, Chip, 1nF	2203-000438	
C531	Ceramic, Chip, 10pF	2203-000278	
C532	Ceramic, Chip, 220pF	2203-000585	
C533	Ceramic, Chip, 100nF	2203-000178	
C534	Tantalum, Chip, 4.7uF	2404-000232	
C535	Ceramic, Chip, 33nF	2203-001416	
C537	Ceramic, Chip, 33nF	2203-001416	
C538	Ceramic, Chip, 15pF	2203-000386	
C541	Ceramic, Chip, 10pF	2203-000278	
C542	Ceramic, Chip, 220pF	2203-000585	
C543	Ceramic, Chip, 3pF	2203-000870	
C544	Ceramic, Chip, 33nF	2203-001416	
C550	Ceramic, Chip, 4pF	2203-001017	
C551	Ceramic, Chip, 10nF	2203-000254	

NO	DESCRIPTION	SEC. CODE	REMARK
	- Diodes -		
D101, D102	Diode, Array, KDS2	0407-000122	
D103	Diode, Array, DAN202	0407-000115	
D104	LED, Chip, RED, 2.0	0601-000355	
D105	Diode, Array, DAN202	0407-000115	
D106, D107	Diode, Array, KDS2	0407-000122	
D108, D109	Diode, MMBZ5234	0403-000283	
D401 ~ D403	Diode, ISV229	0405-000107	
D406	Diode, ISV229	0405-000107	
	- Filters -		
F301	Filter, Duplexer	2909-001037	
F302	Filter, SAW, 1960MHz	2904-001021	
F303	Filter, SAW, 85.38MHz	2904-001041	
F401	Filter-BPF, SAFC130.4M	GH29-30502A	
F402, F403	Filter, SAW, 1880MHz	2904-001020	
	- Connectors -		
J101	Connector, Socket	3710-000341	
J301	Connector, Socket	3710-001021	
J302	SCH-100 CABLE	GH39-30505A	
	- Coils -		
L301	Ceramic, Chip, 1nH	2203-000438	
L302	Inductor, SMD, 2.7nH	2703-000311	
L303	Inductor, SMD, 56nH	2703-001175	
L307	Inductor, SMD, 470nH	2703-000213	
L308	Inductor, SMD, 220nH	2703-000295	
L309-L311	Inductor, SMD, 2.7uH	2703-000301	
L312	Inductor, SMD, 8.2nH	2703-001167	
L313	Inductor, SMD, 3.9nH	2703-001257	
L314	Inductor, SMD, 5.6nH	2703-001166	
L315	Inductor, SMD, 2.2nH	2703-001205	
L316	Inductor, SMD, 270nH	2703-000175	
L317	Inductor, SMD, 27nH	2703-000304	
L401	Inductor, SMD, 27nH	2703-000304	

NO	DESCRIPTION	SEC. CODE	REMARK
L403	Inductor, SMD, 1uH	2703-000300	
L405	Inductor, SMD, 100nH	2703-001049	
L407	Inductor, SMD, 4.7nH	2703-001165	
L408	Chip, 0ohm, 5%	2007-000171	
L410	Inductor, SMD, 680nH	2703-000296	
L412, L413	Inductor, SMD, 2.7uH	2703-000301	
L414, L415	Inductor, SMD, 1uH	2703-000300	
L416	Inductor, SMD, 2.2nH	2703-001288	
L421	Inductor, SMD, 750nH	2703-000237	
L422	Inductor, SMD, 2.2nH	2703-001205	
L423, L424	Inductor, SMD, 2.7nH	2703-000311	
L431, L432	Inductor, SMD, 4.7nH	2703-001264	
L433, L434	Inductor, SMD, 47nH	2703-001259	
	- Transistors -		
Q101	Digital, RN210	0504-000172	
Q102	Small Signal	0501-000457	
Q103	Digital, RN210	0504-000172	
Q104, Q105	Digital, RN110	0504-000167	
Q107, Q108	Small Signal	0501-000218	
Q110	Small Signal	0501-000162	
Q111	Small Signal	0501-000218	
Q112	Small Signal	0501-000457	
Q113	Digital, RN110	0504-000168	
Q302	Small Signal	0501-000218	
Q303	Small Signal	0501-002037	
Q310, Q311	Small Signal	0501-002060	
Q403	Small Signal	0501-000218	
Q404	Small Signal	0501-002060	
Q406	Small Signal	0501-000158	
Q407	Small Signal	0501-000218	
Q408	Small Signal	0501-000162	
Q411	Small Signal	0501-002037	
Q412	Digital, RN110	0504-000167	
Q413	Small Signal	0501-002060	

NO	DESCRIPTION	SEC. CODE	REMARK
	- Resistors -		
R101	Chip, 470ohm, 5%	2007-000932	
R102	Chip, 10Kohm, 5%	2007-000148	
R103	Chip, 0ohm, 5%	2007-000171	
R104	Chip, 47K, 5%	2007-000157	
R105	Chip, 22Kohm, 5%	2007-000153	
R106	Chip, 1Kohm, 5%	2007-000140	
R107	Chip, 22Kohm, 5%	2007-000153	
R108	Chip, 47K, 5%	2007-000157	
R109	Chip, 82Kohm, 5%	2007-000161	
R110	Chip, 47K, 5%	2007-000157	
R111	Chip, 4.7Kohm, 5%	2007-000143	
R112	Chip, 91Kohm, 5%	2007-001244	
R113	Chip, 1Kohm, 5%	2007-000140	
R114	Chip, 10Kohm, 5%	2007-000148	
R116, R117	Chip, 100Kohm, 5%	2007-000162	
R118	Chip, 150Kohm, 5%	2007-000164	
R119	Chip, 39Kohm, 5%	2007-000831	
R120	Chip, 82Kohm, 5%	2007-000161	
R121	Chip, 91Kohm, 5%	2007-001244	
R123	Chip, 1Kohm, 5%	2007-000140	
R124	Chip, 4.7Kohm, 5%	2007-000143	
R125	Chip, 39Kohm, 5%	2007-000831	
R126	Chip, 3.3Kohm, 5%	2007-001325	
R127	Chip, 1Kohm, 5%	2007-000140	
R128	Chip, 15Kohm, 5%	2007-000151	
R130	Chip, 1M', 5%	2007-000170	
R132	Chip, 150ohm, 5%	2007-001306	
R133,R134	Chip, 470ohm, 5%	2007-000932	
R137	Chip, 56ohm, 5%	2007-002970	
R138	Chip, 10Kohm, 5%	2007-000148	
R139, R140	Chip, 150K, 5%	2007-000164	
R141, R142	Chip, 100Kohm, 5%	2007-000162	
R143	Chip, 4.7Kohm, 5%	2007-000143	
R144, R145	Chip, 100Kohm, 5%	2007-000162	
R146	Chip, 2.2K, 5%	2007-000141	

NO	DESCRIPTION	SEC. CODE	REMARK
R147, R148	Chip, 100Kohm, 5%	2007-000162	
R149-R152	Chip, 20K, 5%	2007-000152	
R154	Chip, 10Kohm, 5%	2007-000148	
R155	Chip, 91Kohm, 5%	2007-001244	
R156	Chip, 1Kohm, 5%	2007-000140	
R157, R158	Chip, 10ohm, 5%	2007-000172	
R159	Chip, 22Kohm, 5%	2007-000153	
R160	Chip, 3.3Kohm, 5%	2007-001325	
R161	Chip, 10ohm, 5%	2007-000172	
R162, R163	Chip, 10Kohm, 5%	2007-000148	
R164, R165	Chip, 0ohm, 5%	2007-000171	
R165, R166	Chip, 10Kohm, 5%	2007-000148	
R167	Chip, 4.7Kohm, 5%	2007-000143	
R168	Chip, 39Kohm, 5%	2007-000831	
R169	Chip, 10Kohm, 5%	2007-000148	
R170	Chip, 3Kohm, 5%	2007-001323	
R171, R172	Chip, 100ohm, 5%	2007-000138	
R173	Chip, 100Kohm, 5%	2007-000162	
R174	Chip, 2Kohm, 5%	2007-000137	
R175	Chip, 10Kohm, 5%	2007-000148	
R176	Chip, 100Kohm, 5%	2007-000162	
R179	Chip, 4.7Kohm, 5%	2007-000143	
R180	Chip, 1.2Kohm, 5%	2007-001319	
R181	Chip, 3.9Kohm, 5%	2007-007001	
R184	Chip, 0ohm, 5%	2007-000171	
R194	Chip, 4.7Kohm, 5%	2007-000143	
R301	Chip, 24Kohm, 5%	2007-000154	
R302	Chip, 470ohm, 5%	2007-000932	
R304	Chip, 110ohm, 5%	2007-000322	
R305	Chip, 56ohm, 5%	2007-002970	
R306, R307	Chip, 0ohm, 5%	2007-000171	
R308	Chip, 3.9Kohm, 5%	2007-007001	
R309	Chip, 0ohm, 5%	2007-000171	
R310	Chip, 470ohm, 5%	2007-000932	
R311	Chip, 110ohm, 5%	2007-000322	
R312	Chip, 100ohm, 5%	2007-000138	
R313	Chip, 1Kohm, 5%	2007-000140	

NO	DESCRIPTION	SEC. CODE	REMARK
R314	Chip, 390ohm, 5%	2007-007095	
R315	Chip, 47K, 5%	2007-000157	
R316	Chip, 100ohm, 5%	2007-000138	
R317	Chip, 1Kohm, 5%	2007-000140	
R318	Chip, 100ohm, 5%	2007-000138	
R319	Chip, 1.5Kohm, 5%	2007-000242	
R330	Chip, 56Kohm, 5%	2007-000159	
R333, R334	Chip, 8.2Kohm, 5%	2007-000147	
R335	Chip, 15Kohm, 5%	2007-000151	
R401	Chip, 10Kohm, 5%	2007-000148	
R402	Chip, 1.8Kohm, 5%	2007-001320	
R403-R405	Chip, 10Kohm, 5%	2007-000148	
R406	Chip, 39Kohm, 5%	2007-000831	
R411	Chip, 1.8Kohm, 5%	2007-001320	
R412, R413	Chip, 10Kohm, 5%	2007-000148	
R414, R415	Chip, 1Kohm, 5%	2007-000140	
R416	Chip, 47K, 5%	2007-000157	
R417	Chip, 100ohm, 5%	2007-000138	
R418	Chip, 1Kohm, 5%	2007-000140	
R419	Chip, 1.2Kohm, 5%	2007-001319	
R420	Chip, 3.9Kohm, 5%	2007-007001	
R421	Chip, 10Kohm, 5%	2007-000148	
R424	Chip, 100ohm, 5%	2007-000138	
R425	Chip, 560ohm, 5%	2007-002797	
R426, R427	Chip, 2.7Kohm, 5%	2007-000142	
R428	Chip, 560ohm, 5%	2007-002797	
R429	Chip, 1Kohm, 5%	2007-000140	
R430	Chip, 39ohm, 5%	2007-001295	
R431	Chip, 30ohm, 5%	2007-001291	
R432	Chip, 390ohm, 5%	2007-007095	
R433	Chip, 430ohm, 5%	2007-003019	
R434	Chip, 12K, 5%	2007-000149	
R435	Chip, 51ohm, 5%	2007-001014	
R436	Chip, 4.7Kohm, 5%	2007-000143	
R437	Chip, 2.4ohm, 5%	2007-007200	
R441	Chip, 100ohm, 5%	2007-000138	
R442	Chip, 470ohm, 5%	2007-000932	

NO	DESCRIPTION	SEC. CODE	REMARK
R443	Chip, 22Kohm, 5%	2007-000153	
R444	Chip, 8.2Kohm, 5%	2007-000147	
R445	Chip, 12K, 5%	2007-000149	
R446	Chip, 1Kohm, 5%	2007-000140	
R447	Chip, 470ohm, 5%	2007-000932	
R448	Chip, 4.7Kohm, 5%	2007-000143	
R449	Chip, 180ohm, 5%	2007-001307	
R450	Chip, 4.7Kohm, 5%	2007-000143	
R451	Chip, 24ohm, 5%	2007-000618	
R452	Chip, 4.7Kohm, 5%	2007-000143	
R453	Chip, 10, 5%	2007-000172	
R454	Chip, 10Kohm, 5%	2007-000148	
R455	Chip, 4.7Kohm, 5%	2007-000143	
R456	Chip, 12K, 5%	2007-000149	
R457	Chip, 39ohm, 5%	2007-001295	
R458	Chip, 470ohm, 5%	2007-000932	
R459	Chip, 47Kohm, 5%	2007-000163	
R460	Chip, 1Kohm, 5%	2007-000140	
R461	Chip, 100Kohm, 5%	2007-000162	
R462	Chip, 9.1Kohm, 5%	2007-007013	
R463	Chip, 10Kohm, 5%	2007-000148	
R464	Chip, 3.3Kohm, 5%	2007-001325	
R465	Chip, 39Kohm, 5%	2007-000831	
R466	Chip, 1Kohm, 5%	2007-000140	
R467-R470	Chip, 0ohm, 5%	2007-000171	
R478	Chip, 0ohm, 5%	2007-000171	
R480	Chip, 820ohm, 5%	2007-001316	
R481	Chip, 100ohm, 5%	2007-000138	
R482	Chip, 56Kohm, 5%	2007-000159	
R483	Chip, 100Kohm, 5%	2007-000162	
R484	Chip, 15Kohm, 5%	2007-000151	
R485	Chip, 100ohm, 5%	2007-000138	
R488	Chip, 15Kohm, 1%	2007-007132	
R489	Chip, 12K, 5%	2007-000149	
R490	Chip, 0ohm, 5%	2007-000171	
R499	Chip, 1Kohm, 5%	2007-000140	
R503	Chip, 1.2Kohm, 5%	2007-001319	

NO	DESCRIPTION	SEC. CODE	REMARK
	- IC's -		
U101	IC, Data COMM., GE	1205-001196	
U102	IC, ASP, TLV320AC3	1204-001106	
U103	IC, TTL, 4W53, MUX	0803-003010	
U104	IC, OP Amp, 7101, S	1201-001006	
U105	IC, Audio Amp, 860	1201-000103	
U107	IC, Eeprom, 24LC65	1103-000171	
U109	IC, Reset 809, SOP	1203-000392	
U110, U111	IC, Voltage Regulator	1203-000384	
U112	IC, Flash Memory	1107-001033	
U113, U114	IC, SRAM, 68V1000	1106-000355	
U116	Display-LCD	GH07-20512A	
U119	IC, CMOS Logic, 7S	0801-000885	
U302	Freq, Mixer, DC-40	4709-001029	
U303	IC, AGC Amp, 5500	1201-001075	
U304	IC, PLL Synthesis	1209-001064	
U305	Oscillator, VCO, 2	2806-001021	
U306	Oscillator, VCTCXO	2809-001204	
U307	IC, Switch Regulator	1203-001036	
U401	IC, Data COMM., GE	1205-001203	
U402	IC, PLL Synthesis	1209-001064	
U403	Oscillator, VCO	2806-001022	
U404	IC, AGC Amp, 5505	1201-001076	
U405	IC, Modulator, UPC	1204-001013	
U407	IC, Power Amp, 210	1201-001077	
U410, U411	IC, OP Amp, 7101, S	1201-001006	
U413	FET-P, SI9933, SO	0505-000329	
U414	IC, Switch Regulator	1203-001036	
U415	IC, TTL, 4W53, MUX	0803-003010	
	- Miscellaneous -		
I401	Freq Isolator, 80	4709-001022	
T401	Trans-RF : PCS	GH26-40003A	
X1	Resonator Ceramic, 27MHz	2802-001048	

9-2 Hands-free Car Kit

9-2-1 SCH-1000 HFK

NO	DESCRIPTION	SEC. CODE	REMARK
	- Capacitors -		
C701, C702	Chip, 0.1U	2203-000204	
C703, C704	Chip, 3P	2203-000874	
C705, C706	0.01U	2203-000260	
C713	Chip, 0.1U	2203-000204	
C714	Tantalum, 10U, 10V	2404-000120	
C721, C722	Tantalum, 2.2U, 35V	2404-000292	
C723	0.01U	2203-000260	
C730, C731	1000U, 16V	2401-000039	
C732	Chip, 0.1U	2203-000204	
C733	Chip, 1000P	2203-000440	
C735	Tantalum, 10U, 10V	2404-000120	
C763	Chip, 0.1U	2203-000204	
C767	Tantalum, 2.2U, 35V	2404-000292	
C768	1000U, 25V	2401-000164	
C769	Tantalum, 10U, 10V	2404-000120	
C800-C802	Chip, 0.1U	2203-000204	
C803	Tantalum, 4.7U, 10V	2404-000234	
C804	Tantalum, 22U, 6.3V	2404-000304	
C805, C806	47U, 16V	2401-001509	
C807, C808	Chip, 0.1U	2203-000204	
C809	Chip, 330P	2203-000778	
C810	Chip, 0.1U	2203-000204	
C811	Tantalum, 10U, 10V	2404-000120	
C812	0.01U	2203-000260	
C821	Chip, 0.1U	2203-000204	
C824	Chip, 0.1U	2203-000204	
C825	Chip, 4700P	2203-000891	
C826, C827	Chip, 0.1U	2203-000204	
C828	Tantalum, 2.2U, 35V	2404-000292	
C829, C830	Tantalum, 0.47, 35V	2404-000272	
C831	Tantalum, 2.2U, 35V	2404-000292	
C832	Chip, 0.1U	2203-000204	

NO	DESCRIPTION	SEC. CODE	REMARK
C833, C834	0.01U	2203-000260	
C835, C836	Chip, 0.1U	2203-000204	
C837	470U, 25V	2401-001781	
C838	Chip, 0.1U	2203-000204	
C839	0.01U	2203-000260	
C840	100U, 16V	2401-000042	
C841	Chip, 0.1U	2203-000204	
C842	1000U, 16V	2401-000135	
C845	Chip, 0.1U	2203-000204	
C856	Chip, 0.1U	2203-000204	
C861-C863	Chip, 0.1U	2203-000204	
C864, C865	Tantalum, 10U, 10V	2404-000120	
C866	Chip, 0.1U	2203-000204	
	- Diodes -		
D701, D702	Diode, 1SS226	0407-000122	
D713	Diode, 1N5818	0402-000164	
D715, D716	Diode, 1N5818	0402-000164	
D717	Diode, 1SS226	0407-000122	
D720	Diode, 1N4004	0402-000345	
D721	Diode, 1SS184	0407-000123	
D722	Diode, MMBZ5234BL	0403-000283	
D725	Diode, MMBZ5234BL	0403-000283	
D741-D743	Diode, 1SS184	0407-000123	
	- Connectors -		
JP701	Connector, RP13A-12RC-20PB	3706-000121	
JP702	Connector, 623PCB6-B	3722-000574	
JP703	Connector, RP13A-12RC-13PB	3706-000122	
JP704	Connector, 2P-S2T2	3711-000443	
JP705	Connector, HSJ1045-01-010	3722-001149	
	- Coil -		
L702-L704	Coil, HP-012Z	GH27-40001A	

NO	DESCRIPTION	SEC. CODE	REMARK
	- Transistors -		
Q701-Q703	KSR1104	0504-000129	
Q704	MMBT2907A	0501-000462	
Q708	KSR2102	0504-000154	
Q709	IRF9540	0505-000340	
Q710-Q712	KSR1104	0504-000129	
Q715	KSR1104	0504-000129	
Q717, Q718	KSR1104	0504-000129	
Q801	Chip, 2SA1213	0501-000158	
Q802, Q803	KSR1104	0504-000129	
	- Resistors -		
R701	Chip, 10K	2007-000090	
R702	Chip, 43K	2007-000913	
R704, R705	Chip, 100K	2007-000102	
R706, R707	Chip, 10K	2007-000090	
R708	Chip, Inductor, 1M	2007-000109	
R709	Chip, 4.7K	2007-000871	
R710	Chip, 10K	2007-000090	
R711	Chip, 12K	2007-000354	
R741	Metal, 0.5	2003-000113	
R742	Chip, 1K	2007-000078	
R745	Chip, 6.2K	2007-001056	
R746	Chip, 12K	2007-000354	
R747	Chip, 22K	2007-000094	
R748	Chip, 5.6K	2007-000086	
R750	Chip, 6.2K	2007-001056	
R751, R752	Chip, 18K	2007-000458	
R753	Chip, 12K	2007-000354	
R754	Chip, 22K	2007-000094	
R755	Chip, 100K	2007-000102	
R756	Chip, 22K	2007-000094	
R758	Chip, 10K	2007-000090	
R763	Chip, Inductor, 1M	2007-000109	
R764	Chip, 10K	2007-000090	
R765	Chip, Inductor, 1M	2007-000109	
R766	Chip, 12K	2007-000354	

NO	DESCRIPTION	SEC. CODE	REMARK
R767	Chip, 22K	2007-000094	
R768, R769	Chip, Inductor, 1M	2007-000109	
R770	Chip, 10K	2007-000090	
R771	Chip, 100K	2007-000102	
R772	Chip, 100K	2007-000102	
R781, R782	Chip, 22K	2007-000094	
R787	Chip, 100K	2007-000102	
R788	Chip, 10K	2007-000090	
R789	Chip, Inductor, 1M	2007-000109	
R790	Chip, 10K	2007-000090	
R791	Chip, 4.7K	2007-000871	
R792	Chip, 1K	2007-000078	
R793	Chip, 120K	2007-000103	
R794-R797	Chip, 10K	2007-000090	
R799	Chip, 43K	2007-000913	
R801, R802	Chip, 330K	2007-000133	
R803	Chip, 5.1K	2007-000965	
R804	Chip, 56K	2007-000098	
R805	Chip, 10K	2007-000090	
R806	Chip, 120K	2007-000103	
R807	Chip, 10K	2007-000090	
R808, R809	Chip, 100K	2007-000102	
R810	Chip, 5.1K	2007-000965	
R811	Chip, 220K	2007-000106	
R812	Chip, 47K	2007-000097	
R813	Chip, 1K	2007-000078	
R814	Chip, 2.2K	2007-000124	
R815	Chip, 330K	2007-000133	
R816	Chip, 10K	2007-000090	
R817	Chip, 2.2K	2007-000124	
R818	Chip, 100K	2007-000102	
R821-R823	Chip, 330K	2007-000133	
R825	Chip, 56K	2007-000098	
R826, R827	Chip, 5.1K	2007-000965	
R828	Chip, 22K	2007-000094	
R829	Chip, 47K	2007-000097	

NO	DESCRIPTION	SEC. CODE	REMARK
R830	Chip, 10K	2007-000090	
R832	Chip, 330K	2007-000133	
R833	Chip, 120K	2007-000103	
R834	Chip, 3.3	2007-000695	
R842	Chip, 180K	2007-000132	
R843	Chip, 120K	2007-000103	
R844	Chip, 82K	2007-000101	
R845	Chip, 56K	2007-000098	
R846	Chip, 33K	2007-000134	
R847	Chip, 15K	2007-000092	
R848	Chip, 5.1K	2007-000965	
R849	Chip, 100K	2007-000102	
R850	Chip, 22K	2007-000094	
R861-R863	Chip, 330K	2007-000133	
R864	Chip, 100	2007-000074	
	- IC's -		
U703	IC, TMP91P640-10	0903-000123	
U704	IC, LP2951ACM	1203-000148	
U705, U706	IC, LM2576	1203-000185	
U707, U709	IC, LM2904D	1201-000181	
U801	IC, LM2902D	1201-000239	
U802	IC, MC34118DW	1204-000282	
U803	IC, MC14053BD	1001-000171	
U804	IC, TDA1010	1201-000386	
U805	IC, MC14051BD	1201-000121	
U808	IC, ICL7660	1203-000269	
	- Miscellaneous -		
VZR701	VZR, ENB330D-10B	1405-000136	
X701	X-Tal, 4.9152MHz	2801-003292	

9-2-2 SCH-1000 Cradle

NO	DESCRIPTION	SEC. CODE	REMARK
	- Capacitors -		
C871 C872	GRM40X7R104K25PT GRM39COG221J50PT	2203-000204 2203-000592	
	- Diode -		
D873	SLV-1529SAM5207-(B)	0604-000353	
	- Connectors -		
JP871 JP872 JP874	Connector, Gils-15P-S2L2-EF Connector, Gils-12P-S2L2-EF Connector, ESQ-103-44-T-D	3711-000425 3711-002036 3711-002036	
	- Transistor -		
Q871, Q872	Digital, KAR1104	0504-000129	
	- Resistors -		
R871 R874 R875, R876 R877	MCRO3EZHJ221T MCRO3GEZH123T MCRO3EZHJ331T MCRO3EZHJ102T	3711-002036 2007-000354 3711-002036 3711-002036	
	- Miscellaneous -		
TH871 U871	NTH300XQ103E01 SG-215	0604-000118 0604-000166	

9-2-3 Cable & Accessories

NO	DESCRIPTION	SEC. CODE	REMARK
	Antenna, Gold Microphone Cable, Power Curly Cord Cable, Data, 15Pin Speaker, 3W Antenna, Onglass	GH96-00733A GH96-00736 GH39-10501A GH39-60506A GH81-10504A 3001-000186 3001-000186	

9-3 Desk-Top Rapid Charger

NO	DESCRIPTION	SEC. CODE	REMARK
	- Capacitors -		
C1	Electrolytic, 100ßfi, 25V		
C2, C3	Chip, 0805, 0.1uF, K (104)		
C4	Electrolytic, 100ßfi, 16V		
C5	Electrolytic, 470ßfi, 25V		
C6	Chip, 0805, 0.1uF, K (104)		
C8, C9	Electrolytic, 10ßfi, 16V		
C10, C11	Chip, 0805, 220pF, J (221)		
C13	Chip, 0805, 0.1uF, K (104)		
C14	Chip, 0805, 220pF, J (221)		
C15, C16	Chip, 0805, 0.1uF, K (104)		
C17	Chip, 0805, 5600pF, J (562)		
C18	Chip, 0805, 220pF, J (221)		
C19, C20	Chip, 0805, 22pF, J (220)		
C21	Chip, 0805, 0.1uF, K (104)		
C51, C52	Chip, 0805, 0.1uF, K (104)		
C90-C94	Chip, 0805, 0.1uF, K (104)		
C100	Chip, 0805, 0.01uF, J (103)		
	- Diodes -		
D1	S/B, DO-41, 40V, 1A, 1N5819		
D2	Zener, SOT-23, 22V, MA3240L		
D3	G/P, SOT-23, 80V, 100mA, KDS181		
D4, D5	S/B, DO-41, 40V, 1A, 1N5819		
D6	G/P, SOT-23, 80V, 100mA, KDS181		
D7-D10	G/P, SOT-23, 80V, 100mA, KDS226		
	- LED's -		
LD1, LD2	LED, 2-Color, 225RGW-1		
LD1, LD2	LED, Ass'y		

NO	DESCRIPTION	SEC. CODE	REMARK
	- Coil -		
L1	Coil, Choke, 220uH		
	- Transistors -		
Q1	PNP, SOT-23, -50V, -100mA, 200mW, KSR2102		
	PNP, SOT-23, -50V, -100mA, 200mW, KRA102S		
Q2	FET, P-Channel, D-Pack, -50V, -9.9A, 0.28ßŸ, IRFR9020		
Q3, Q4	PNP, TO-126, -60V, -8A, KSB1151, Y		
Q5	PNP, SOT-23, -60V, -600mA, 350mW, KST2907		
	PNP, SOT-23, -60V, -600mA, 350mW, KTN2907AS		
Q6, Q7	PNP, SOT-23, -40V, -100mA, 200mW, KSR2110		
	PNP, SOT-23, -40V, -100mA, 200mW, KRA111S		
Q8, Q9	NPN, SOT-23, 50V, 100mA, 200mW, KSR1101		
	NPN, SOT-23, 50V, 100mA, 200mW, KRC101S		
Q10	NPN, TO-92, 40V, 500mA, Darlington, KSP25		
	NPN, TO-92, 40V, 500mA, Darlington, MPSA25		
Q11-Q14	PNP, SOT-23, -50V, -100mA, 200mW, KSR2102		
	PNP, SOT-23, -50V, -100mA, 200mW, KRA102S		
Q15, Q16	SMD-5P, Dual, UMC5		
Q17	NPN, SOT-23, 50V, 100mA, 200mW, KSR1104		
	NPN, SOT-23, 50V, 100mA, 200mW, KRC104S		
	- Resistors -		
R1	Chip, 0805, 18KßŸ, J		
R2	Chip, 0805, 10KßŸ, J		
R3	Chip, 0805, 18KßŸ, J		
R4, R5	Chip, 0805, 100KßŸ, J		
R6	Chip, 0805, 18KßŸ, J		
R7	1W, 0.56ßŸ, F		
R8	Chip, 0805, 300ßŸ, J		
R9, R10	1/4W, 330ßŸ, F		
R11, R12	Chip, 0805, 30ßŸ, F		
R13	2W, 15ßŸ, J		
R14	Chip, 0805, 10KßŸ, J		

NO	DESCRIPTION	SEC. CODE	REMARK
R15	Chip, 0805, 4.7KßŸ, J		
R16-R19	Chip, 0805, 30ßŸ, J		
R20	1/4W, 470ßŸ, F		
R21	2W, 75ßŸ, F		
R22, R23	Chip, 0805, 2.2KßŸ, J		
R24	Chip, 0805, 12KßŸ, J		
R25	Chip, 0805, 22KßŸ, J		
R26	Chip, 0805, 12KßŸ, J		
R27-R29	Chip, 0805, 22KßŸ, J		
R30, R31	Chip, 0805, 2.2KßŸ, J		
R32, R33	Chip, 0805, 12KßŸ, J		
R34	Chip, 0805, 4.7KßŸ, F		
R35	Chip, 0805, 12KßŸ, F		
R36	Chip, 0805, 4.7KßŸ, F		
R37	Chip, 0805, 12KßŸ, F		
R38, R39	Chip, 0805, 220ßŸ, J		
R40	Chip, 0805, 1KßŸ, J		
R41	Chip, 0805, 10KßŸ, J		
R42	Chip, 0805, 47KßŸ, J		
R43	Chip, 0805, 4.7KßŸ, F		
R44	Chip, 0805, 12KßŸ, F		
R46	Chip, 0805, 100KßŸ, J		
R47	Chip, 0805, 1KßŸ, J		
R48	Chip, 0805, 220ßŸ, J		
R51	Chip, 0805, 220ßŸ, J		
	- IC's -		
U0	MPU, S-DIP, 28P, HD4074344		
U1	SO-8P, 5V, 100MA, MIC2951, LP2951ACM		
U2	Heat Sink, 38.1*22, AL, 2t, PCS_GB4		
U2	TO-220, 3A, Step-Down V.Reg, LM2576T-ADJ		
U3, U4	SO-8P, Dual, OP-Amp, KA358D		
U5	SO-8P, Analog, S/W, TC4W53F		

NO	DESCRIPTION	SEC. CODE	REMARK
	- Miscellaneous -		
SW1	Switch, KPT1105S		
TH1	Thermist.or, 10KßŸ/25°..., NTH300XQ103E01		
	Thermist.or, 10KßŸ/25°..., TG310H37		
X1	X-Tal, 4MHz, 18PF, 49S-4MHz-18pF		
	X-Tal, 4MHz, 18PF, HC491S/4M-18P		
	DC, Jack		
	Case, Top, PCS_GA1		
	Case, Bottom, PCS_GA2		
	Battery, Housing, PCS_GA3		
	S/W, KNOB, PCS_GA4		
	Contact, Base, PCS_GA5		
	Terminal, PCS_GB1		
	Hook, Ass'y, Right, PCS_GB2		
	Hook, Ass'y, Left, PCS_GB3		
	Label, PCS_GC1		
	Bumpon, 10°ø1.6t, PCS_GC2		
	Label, 8°ø8°ø0.4t, PCS_GC3		
	Screw, BHT- °ø3°ø5		
	Screw, BHT- °ø3°ø8		
	Screw, BHT- °ø2.6°ø6		
	Screw, BHT- °ø2.6°ø12		

9-4 Cigarette Lighter Adapter

NO	DESCRIPTION	SEC. CODE	REMARK
	- Capacitors -		
C1	Electrolytic, 100u, 25V, CESSL1E101M0611AB		
C2	Chip, 1000P, CL10B102KBNCA		
C3	Electrolytic, 200u, 16V, CESSL1C221M0812AB		
C4	Chip, 0.1u, CL21B104KNER		
C6, C7	Tantalum, Chip, 4.7u, 6.3V, TCSCS0J475MAAR		
C9, C10	Tantalum, Chip, 4.7u, 6.3V, TCSCS0J475MAAR		
C11	Chip, 0.1u, CL21B104KNER		
C12	Tantalum, Chip, 4.7u, 16V, TCSCS1C476MBAR		
C13	Tantalum, Chip, 4.7u, 6.3V, TCSCS0J475MAAR		
	- Diodes -		
D1	Diode, 1N4004		
D2	Diode, Zener, 1N5818		
D3	Diode, 1N4004		
D4	Diode, Zener, 1N5818		
D5	Diode, Chip, SDS2838		
D6	LED (Green), SM3511		
D7	Diode, Chip, SDS2838		
D8	Diode, Zener, 1N5818		
	- Filter -		
F1, F2	Fuse, 250V, 2A, 41MS		
	- Connectors -		
J3	Connector, 5pin, GIL-S-5P-S2T2-EF		
	- Coil -		
L1	Coil, RF210		
L2	Coil, AS59-8003		
	- Transistors -		
Q1	KSB1151-Y		
Q2	Chip, KST2907A		
Q3-Q5	Chip, KSR1104		
Q7, Q8	Chip, KSR1104		

NO	DESCRIPTION	SEC. CODE	REMARK
	- Resistors -		
R1	Chip, 47K, RC1608J473CS		
R2, R3	Chip, 1.8K, RC1608J182CS		
R4	0.5, 5%, 1/4W, CR1/4W, 0.5, J, TB		
R5	Chip, 51K, RC1608J513CS		
R6	Chip, 150K, RC1608J154CS		
R7	Chip, 200K, RC1608J204CS		
R8	Chip, 47K, RC1608J473CS		
R9	Chip, 1M, RC1608J105CS		
R10, R11	Chip, 39K, RC1608J393CS		
R12	Chip, 13K, RC1608J133CS		
R13	Chip, 330, RC1608J331CS		
R14	Chip, 3.3K, RC1608J332CS		
R15	Chip, 510, RC1608J511CS		
R16	Chip, 13K, RC1608J133CS		
R17	Chip, 4.3K, RC1608F432CS		
R18	Chip, 15K, RC1608F153CS		
R19	Chip, 1K, RC1608J331CS		
R21	Chip, 270, RC1608J271CS		
R22, R23	Chip, 1K, RC1608J102CS		
R24	Chip, 100K, RC1608J104CS		
R25	Chip, 200K, RC1608J204CS		
R26	Chip, 4.7K, RC1608F472CS		
R27	Chip, 12K, RC1608F123CS		
R28	Chip, 47K, RC1608F473CS		
R29	Chip, 100K, RC1608J104CS		
R31	Chip, 62K, RC1608F623CS		
R32	Chip, 150K, RC1608F154CS		
R35	Chip, 1.3M, RC1608F135CS		
R37	Chip, 2.7M, RC1608F275CS		
R40	Chip, 100K, RC1608J104CS		
R41	Chip, 1.1M, RC1608F115CS		
R42	Chip, 2M, RC1608F205CS		

NO	DESCRIPTION	SEC. CODE	REMARK
	- IC's -		
U1	IC, 16pin, KA7500B		
U2	IC, OP Amp, 8pin, KA2904D/T		
U3	IC, OP Amp, 14pin, KA2902D/T		
	- Miscellaneous -		
TH1	Thimster, TH310H36GBNI		
	Curl, Ass'y, 5pin		
	GND, Harness		
	Upper, Housing		
	Lower, Housing		
	Fuse, Cover		
	Fuse, Holder		
	Fuse, Plate		
	Outer, Spring		
	Power, Contact		
	Spring, CLC		
	Label, CLC		
	Taptite, Screw		
	Poly, Box		
	Carton, Box		
	Corrugated, PAD		

9-5 Travel Charger

NO	DESCRIPTION	SEC. CODE
	- Capacitors -	
C1	X, 100nF, 250V, KNB15300-104	2305-000139
	X, 100nF, 250V, PCX2-335-104	61267-10424ME
C3, C4	Electrical, 4.7uF, 250V, 8.5°…, 10°ø12.5mm, CESSL2E4R7M	2401-001233
	Electrical, 4.7uF, 250V, 8.5°…, 10°ø12.5mm, SMS2E4R7M	2401-002413
C5	Film, 15nF, 20%, 630V, 400°ø15.5°ø4.5°ø9.5mm, MMD153M630V-12.5P	2305-000199
	Film, 15nF, 20%, 630V, 400°ø15.5°ø4.5°ø9.5mm, MMD153M630V-12.5P	2305-000499
C6	Chip, 2012, 104-K, X7R, CL21B104KBNC	2203-000206
C7	Chip, 2012, 103-K, X7R, CL21B103KBNC	2203-001458
C9	Y, 2.2nF, 20%, 25, 0V, HCYE2G222MAAT	2201-001004
C20	Y, 2.2nF, 20%, 25, 0V, HCYE2G222MAAT	2201-001004
C21	Electrical, 270uF, 16V, 10, 5°…, 10°ø12.5mm, CESTL1C271M	2401-003161
	Electrical, 270uF, 16V, 10, 5°…, 10°ø12.5mm, SXE16VB270M	2401-003161
C23, C24	Chip, 2012, 221-J, NPO, CL21C221JBNC	2203-000590
C25	Electrical, 10uF, 25V, 85°…, 5°ø5mm, CESSM1E100M	2401-002353
	Electrical, 10uF, 25V, 85°…, 5°ø5mm, SRE25VB100M	2401-002568
C26	Chip, 2012, 104-K, X7R, CL21B104KBNC	2203-000206
C27	Electrical, 1uF, 50V, 85°…, 4°ø7mm, CESSM1H1ROM	2401-000596
	Electrical, 1uF, 50V, 85°…, 4°ø7mm, SRA1HVB010M	2401-000593
C28	Electrical, 100uF, 16V, 85°…, 6.3°ø7mm, CESSM1C101M	2401-000250
	Electrical, 100uF, 16V, 85°…, 6.3°ø7mm, SRAICV101M	2401-000250
C29, C30	Chip, 2012, 104-K, X7R, CL21B104KBNC	2203-000206
C31	Chip, 2012, 474-K, Z5U, CL21F474ZBNC	2203-000922
C32	Electrical, 3.3uF, 50V, 85°…, 4°ø7mm, SCH-1000-TC, CESSM1H3R3M	2401-001020
	Electrical, 3.3uF, 50V, 85°…, 4°ø7mm, SCH-1000-TC, SRE1HVB3R3M	2401-002180
C33	Electrical, 4.7uF, 50V, 85°…, 5°ø7mm, CESSM1H4R7M	2401-003167
	Electrical, 4.7uF, 50V, 85°…, 5°ø7mm, SRA1HVB4R7M	2401-001276
C34	Electrical, 3.3uF, 50V, 85°…, 4°ø7mm, SCH-1000-TC, CESSM1H3R3M	2401-001020
	Electrical, 3.3uF, 50V, 85°…, 4°ø7mm, SCH-1000-TC, SRE1HVB3R3M	2401-002180
C35	Chip, 2012, 104-K, X7R, CL21B104KBNC	2203-000206
C36	Electrical, 10uF, 25V, 85°…, 5°ø5mm, CESSM1E100M	2401-002353
	Electrical, 10uF, 25V, 85°…, 5°ø5mm, SRE25VB100M	2401-002568
C37	Chip, 2012, 474-K, Z5U, CL21F474ZBNC	2203-000922

NO	DESCRIPTION	SEC. CODE
	- Diodes -	
D1	Diode, Bridge, 600V, 1A, S1VB, A60	0402-000524
D2	Diode, FR, 1000V, 1A, BYV38	0402-000495
	Diode, FR, 1000V, 1A, UF4007	0402-000012
D3	Diode, Ultra, High, Speed, SOT-23, 85V, 100mA, 0.92V, KDS181 (A3)	60222-00181KA
	Diode, Ultra, High, Speed, SOT-23, 85V, 100mA, 0.92V, DAP202K (P)	0407-000116
D4	Diode, Zener, 18V-Y, Z02W18VY	0403-000742
D20, D21	Diode, Schottky, 40V, 1A, 1N5819	0402-000358
	Diode, Schottky, 40V, 1A, 11DQ04	0402-000124
D22-D25	Diode, Ultra, High, Speed, SOT-23, 85V, 100mA, 0.92V, KDS181 (A3)	60222-00181KA
	Diode, Ultra, High, Speed, SOT-23, 85V, 100mA, 0.92V, DAP202K (P)	0407-000116
D26	Diode, IN4148	0401-000140
	- Filter -	
F1, F2	Fuse, 250VAC, 500mA, MST0034, 6612	3601-001035
	Fuse, 250VAC, 500mA, MRT500	3601-001035
	- LED -	
LD1	LED, RED/GRN Dual, 5°ø2, SAM5280	0601-001107
	LED, RED/GRN Dual, 5°ø2, AL-225RGW	0601-001107
	LED, RED/GRN Dual, 5°ø2, SMW-0523M	0601-001107
	- Transistors -	
Q1	FET-MOS (N), TO-220, 500V, 8A, IRF840	0505-001069
	FET-MOS (N), TO-220, 500V, 8A, IRF840	0505-000135
Q2	NPN, SOT-23, 60V, 600mA, KST2222ATF (1P)	0501-000458
Q20	FET-MOS (P), I-PAK, 50V, 3A, 2SJ132	0505-001105
	FET-MOS (P), I-PAK, 50V, 3A, IRFU9120	0505-001022
Q21	NPN, SOT-23, 50V, 100mA (Bias Resistor), DTC144EKA (26)	0504-000186
	NPN, SOT-23, 50V, 100mA (Bias Resistor), KSR1104 (R04)	0504-000129
Q22, Q23	PNP, SOT-23, 60V, 600mA (Bias Resistor), DTA114EKA	0504-000001
	PNP, SOT-23, 60V, 600mA (Bias Resistor), KSR2102	0504-000154
Q24	NPN, SOT-23, 60V, 600mA, KST2222ATF (1P)	0501-000458
	- Resistors -	
R1	Metal Oxide, 1W, 470K, 5%, MOR-1, 470K, J	2003-001064
R2	Wire Wound, 1/2W, 0.5•ÿ, 1%, ARW1/2N, 0.5, F, TP	2005-001007
R1, R2	Chip, 2012, 000•ÿ, 5%, RC2012J000CS	2007-000029

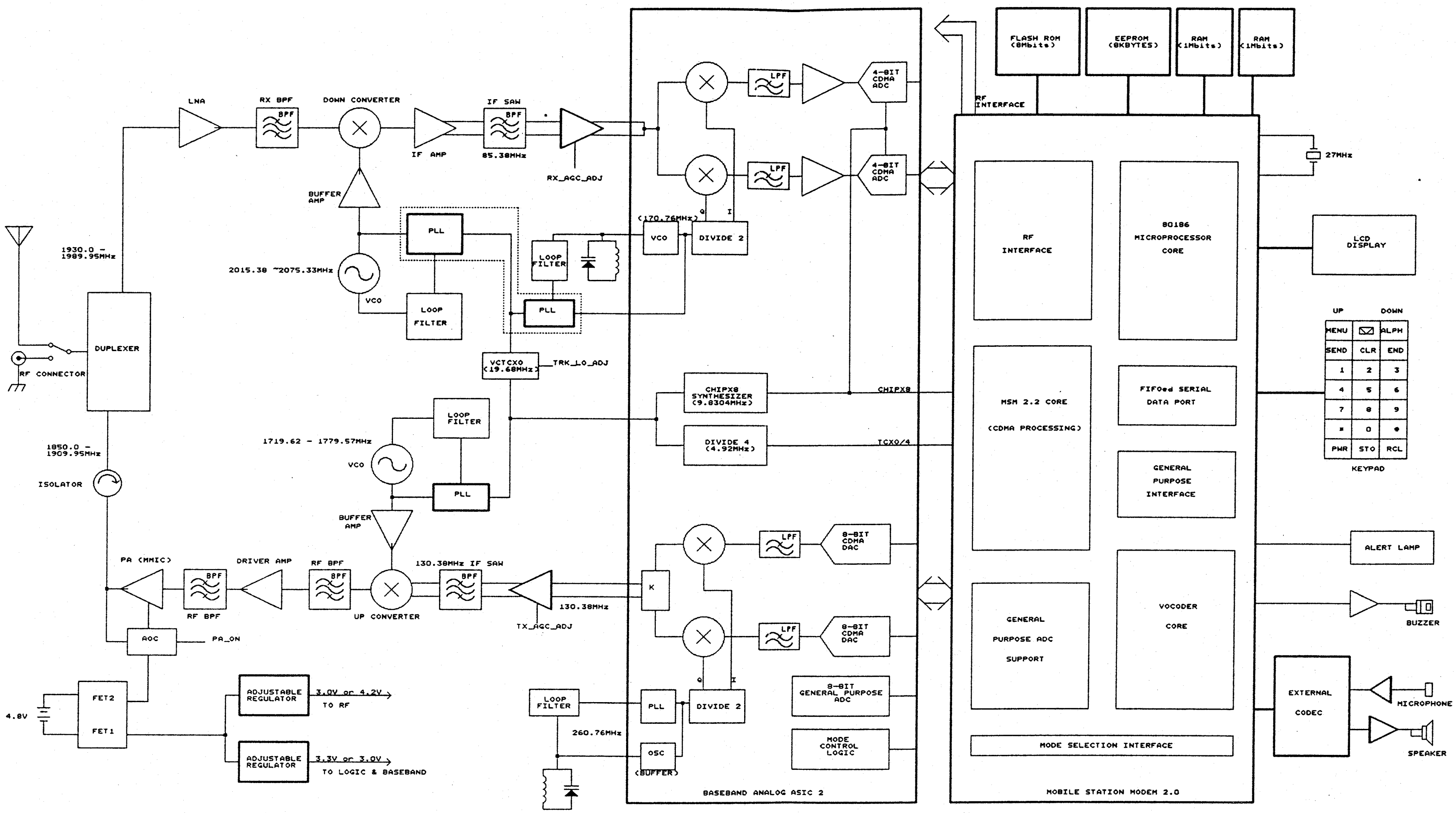
NO	DESCRIPTION	SEC. CODE
R3-R7	Chip, 2012, 39K•ÿ, 1%, RC2012F3902CS	2007-000827
R8, R9	Chip, 2012, 300•ÿ, 5%, RC2012J301CS	2007-000728
R10	Chip, 2012, 1K•ÿ, 1%, RC2012F1001CS	2007-000465
R12	Surage, 1/2W, 4.7M, 5%, RCR50+T524.7MJ	2009-001039
R20	Surage, 1/2W, 4.7M, 5%, RCR50+T524.7MJ	2009-001039
R21	Wire Wound, 1/2W, 0.5•ÿ, 1%, ARW1/2N, 0.5, F, TP	2005-001007
R22, R23	Chip, 2012, 20•ÿ, 5%, RC2012J200CS	2007-000551
R24, R25	Chip, 2012, 100•ÿ, 5%, RC2012J101CS	2007-000290
R26	Chip, 2012, 300•ÿ, 5%, RC2012J301CS	2007-000728
R27	Chip, 2012, 15K•ÿ, 1%, RC2012F1502CS	2007-000406
R28	Chip, 2012, 9.1K•ÿ, 5%, RC2012J912CS	2007-001224
	Chip, 2012, 9.1K•ÿ, 5%, MCR10EZHUJ912	2007-001224
R29	Chip, 2012, 20K•ÿ, 5%, RC2012J203CS	2007-000546
R30	Chip, 2012, 30K•ÿ, 1%, RC2012F3002CS	2007-000735
R31	Chip, 2012, 1K•ÿ, 1%, RC2012F1001CS	2007-000465
R32	Chip, 2012, 100•ÿ, 5%, RC2012J101CS	2007-000290
R33	Chip, 2012, 10K•ÿ, 1%, RC2012F1002CS	2007-000297
R34	Chip, 2012, 20K•ÿ, 5%, RC2012J203CS	2007-000546
R35, R36	Chip, 2012, 10K•ÿ, 1%, RC2012F1002CS	2007-000297
R37	Chip, 2012, 1K•ÿ, 1%, RC2012F1001CS	2007-000465
R38	Chip, 2012, 10K•ÿ, 1%, RC2012F1002CS	2007-000297
R39, R40	Chip, 2012, 1M•ÿ, 1%, RC2012F1004CS	2007-000474
R41	Chip, 2012, 33K•ÿ, 1% RC2012F3002CS	2007-000735
R42, R43	Chip, 2012, 30K•ÿ, 1%, RC2012F3002CS	2007-000735
R44	Chip, 2012, 39K•ÿ, 1%, RC2012F3902CS	2007-000827
R45	Chip, 2012, 4.7K•ÿ, 1%, RC2012F4701CS	2007-000868
R46	Chip, 2012, 150•ÿ, 5% RC2012J000CS	2007-000029
R47	Chip, 2012, 11K•ÿ, 1%, RC2012F1102CS	2007-000327
R48	NTC (Thermistor), 10K•ÿ, 25°…, TH310H37GBNT	1404-001014
R49	Chip, 2012, 4.7K•ÿ, 1%, RC2012F4701CS	2007-000868
R50	Chip, 2012, 000•ÿ, 5%, RC2012J000CS	2007-000029
R51	Chip, 2012, 12K•ÿ, 1%, RC2012F1202CS	2007-000352
R52	Chip, 2012, 4.7K•ÿ, 1%, RC2012F4701CS	2007-000868
R53	Chip, 2012, 10K•ÿ, 1%, RC2012F1002CS	2007-000297
R54	Chip, 2012, 1.5K•ÿ, 1%, RC2012F1501CS	2007-000238
R55	Chip, 2012, 10K•ÿ, 1%, RC2012F1002CS	2007-000297
R56	Chip, 2012, 7.5K•ÿ, 1%, RC2012F7501CS	2007-001138

NO	DESCRIPTION	SEC. CODE
R57	Chip, 2012, 200•ÿ, 5%, RC2012J201CS	2007-000026
R60	Chip, 2012, 2K•ÿ, 5%, RC2012J202CS	2007-000671
R61	Chip, 2012, 1.5K•ÿ, 1%, RC2012F1501CS	2007-000238
R62	Chip, 2012, 0•ÿ, 1%, RC2012F1001CS	2007-000465
	- IC's -	
U20	IC, Regulator, 5V, 100mA, TO-92, LT1121CZ-5	1203-001177
	IC, Regulator, 5V, 100mA, TO-92, LE50CZ	1203-001177
	IC, Regulator, 5V, 100mA, TO-92, LP2950C	1203-001177
U21	IC, Linear, 35V, 100mA, TO-9, KA431Z	1203-000187
U22	IC, OP Amp, 28V, 0.15uA, Dual, DIP-8P, KA358A	1201-000530
	IC, OP Amp, 28V, 0.15uA, Dual, DIP-8P, LM358A	1201-000530
U23, U24	IC, COMP., 36V, 1mA, Dual, DIP-8P, KA393A	1202-001006
	IC, COMP., 36V, 1mA, Dual, DIP-8P, LM393A	1202-001006
	- Miscellaneous -	
LF1	Line Filter, UU1014, 22mH (Min), LF1	ML29-00023E
OP1	Photo-Coupler, 130-260%, 200mW, DIP-4, ST, PC817B	0604-000191
	Photo-Coupler, 130-260%, 200mW, DIP-4, ST, TLP621GR	0604-000191
T01	Trans, TC-001	ML26-00261S
VA1	Varistor, 198-242V, 3500A, 15°ø18mm, TP, D6221ZOV141RA07	1405-000196
	Varistor, 198-242V, 3500A, 15°ø18mm, TP, D6221ZOV151RA07	1405-000194
	Label SCH1000-TC, 30°ø70mm	ML68-00276X
	Terminal-Bat, 5.5°ø30mm, 4, AGTC-04	3711
	Terminal-Input, 4°ø18°ø12mm, 3	ML71-00291E
	Case Ass'y-Cover, Cover, Gate, Label, Plug, Ass'y, PCS-TC-C	ML72-00238J
	Case Ass'y-Bottom, Bottom, Gate, Label, Ass'y, PCS-TC-B	ML72-00238K
	PCB, FR-4, 1.2t, 1oz48°ø131SCH-1000-TC, PCS-TC	ML41-00223R
	Screw-TAP, PH+, 2.6°ø10, BLK	6002-001014
	Packing-Box, SW (A), 518°ø34, 1°ø260	ML69-0007A
	Packing-NIL-PAD, SW (A), 513°ø33, 6	ML69-00028A
	Packing-C/P-A, SW (A), 513°ø78	ML69-00099E
	Packing-C/P-B, SW (A), 336°ø78	ML69-00099F
	Packing-C/P-B, SW (A), 609°ø33, 6	ML69-00099D
	Adhesive, Sealant, DC739	0201-001029

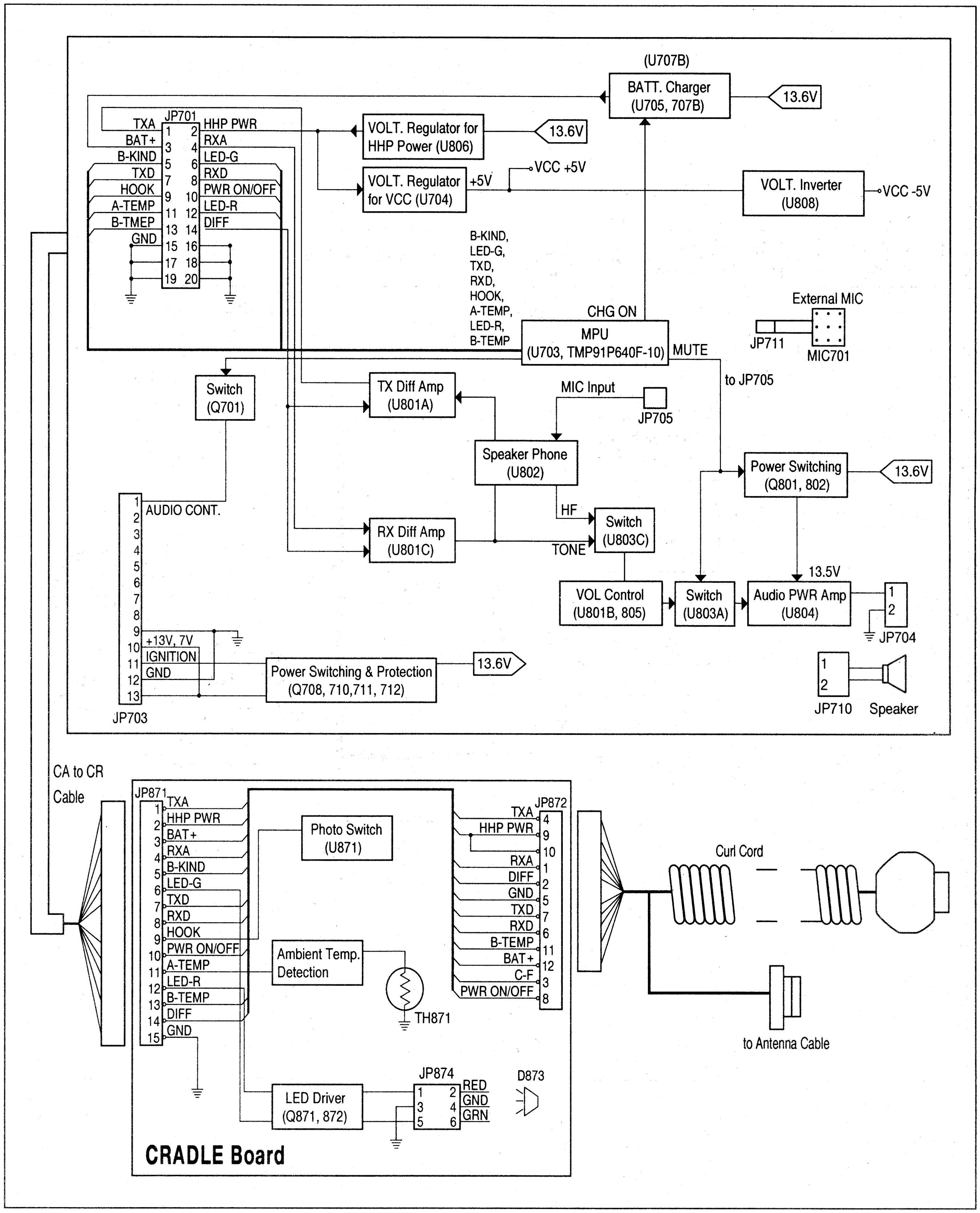
MEMO

10. Block & Circuit Diagrams

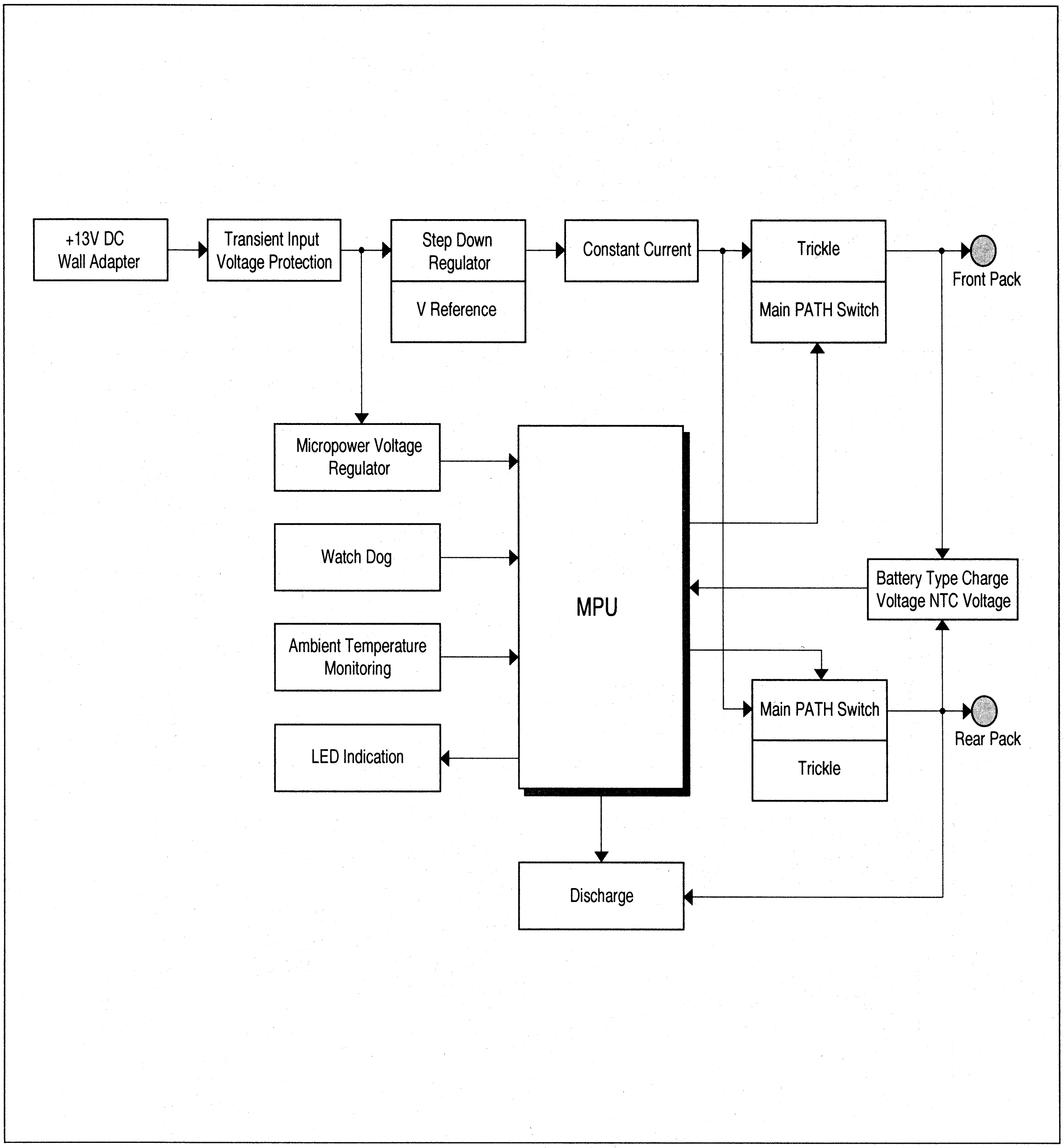
10-1 Main Block Diagram



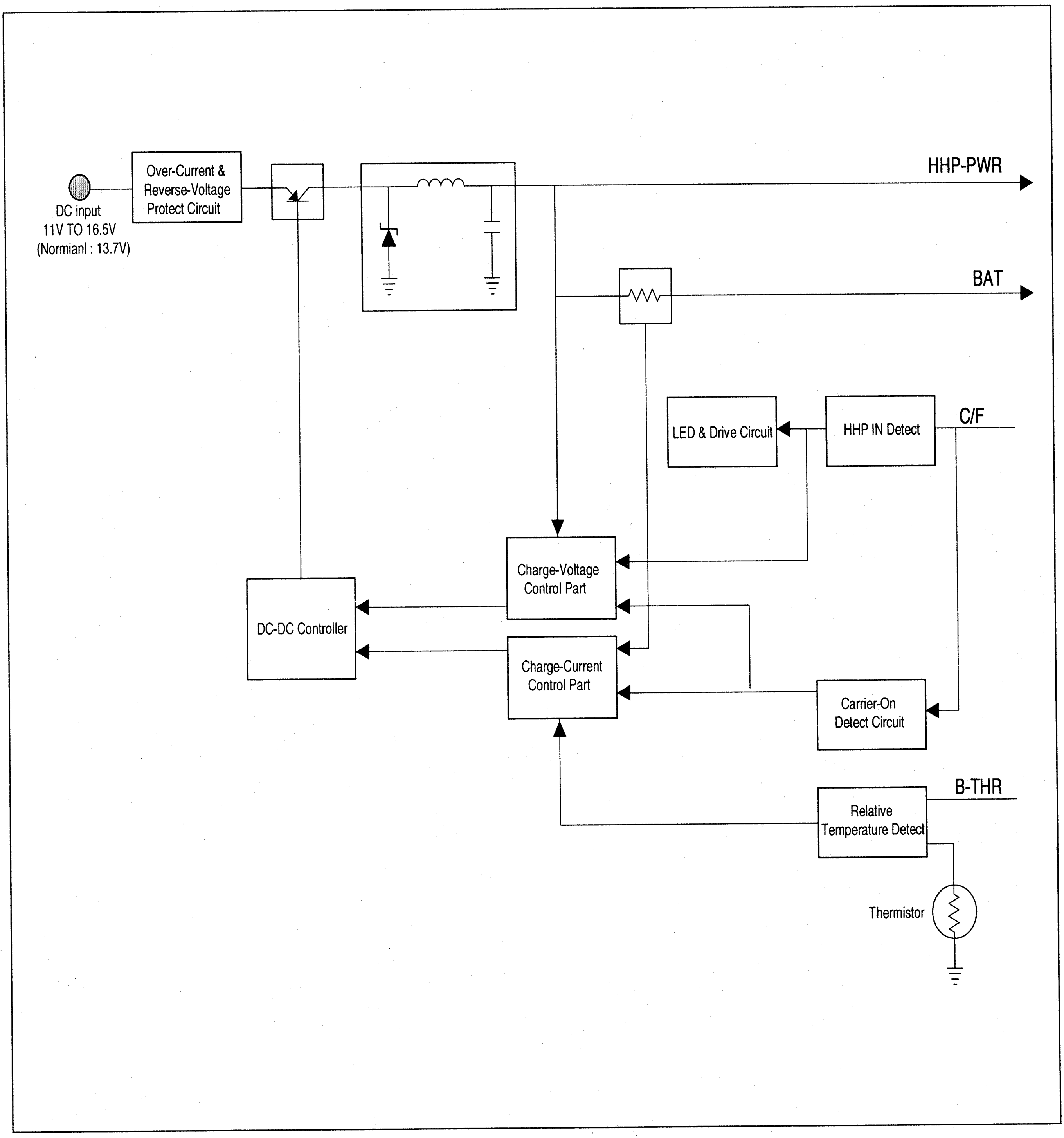
10-2 Hands-Free Kit Block Diagram



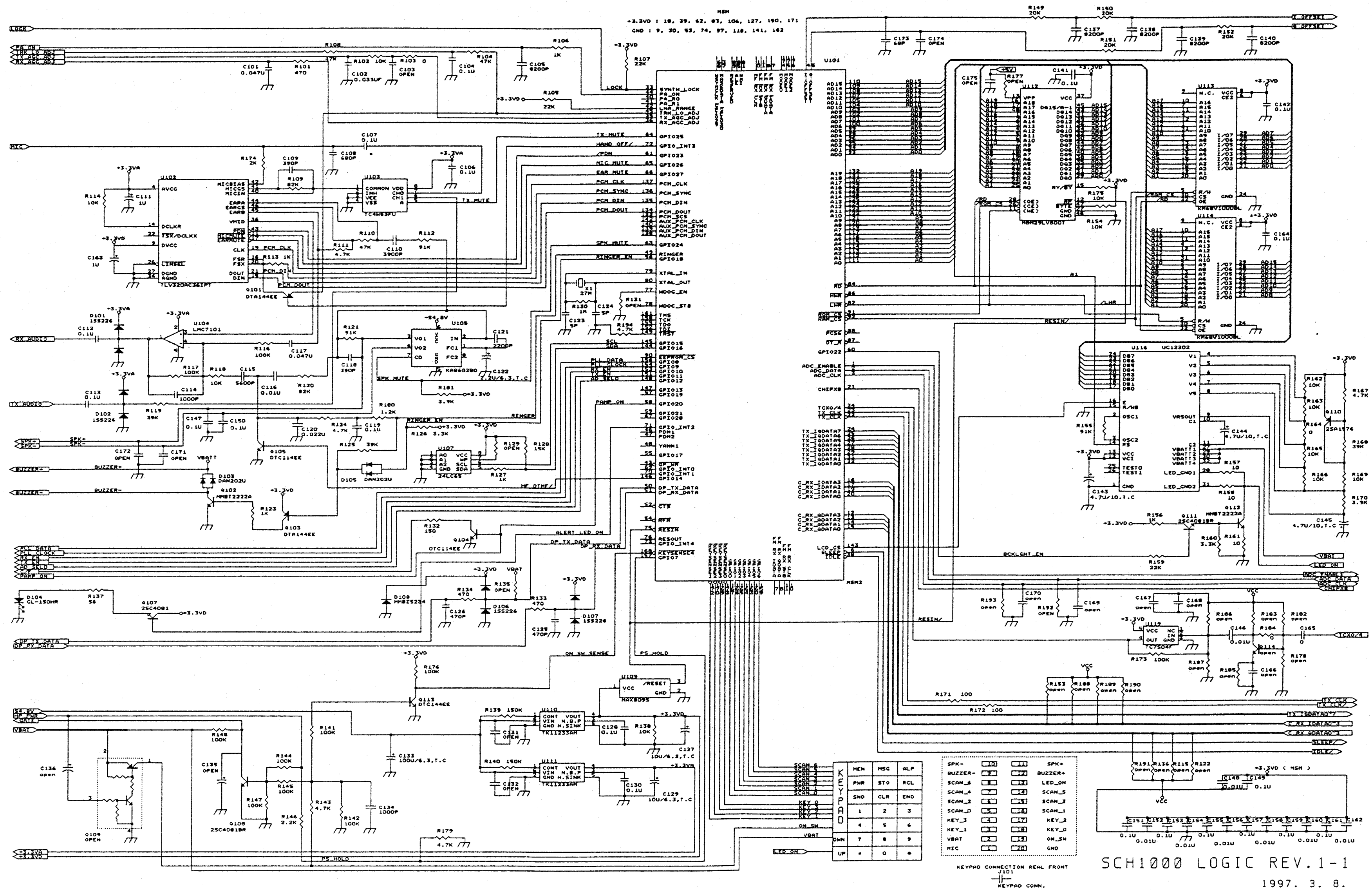
10-3 Desk-Top Rapid Charger Block Diagram



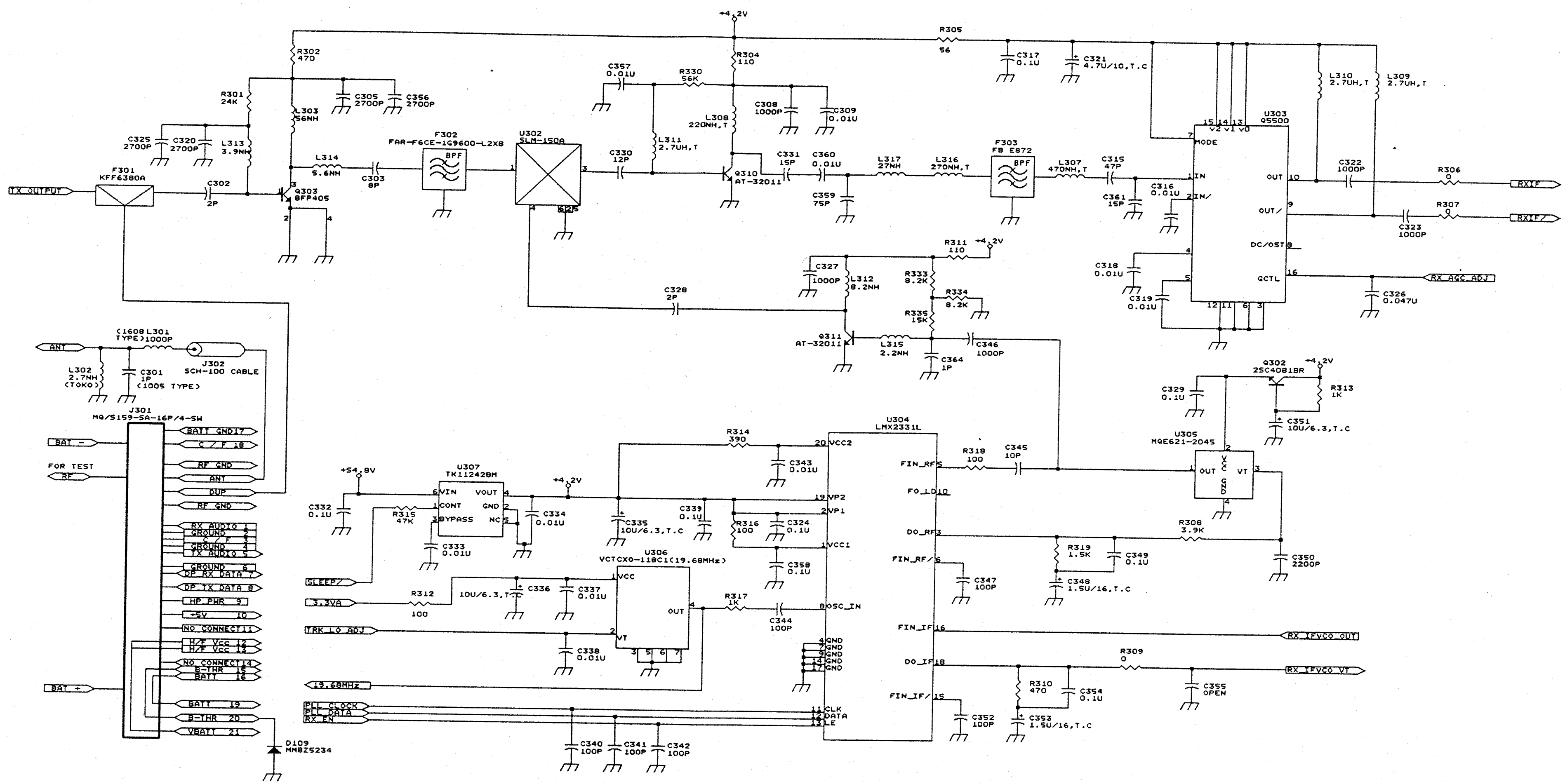
10-4 Cigarette Lighter Adapter Block Diagram



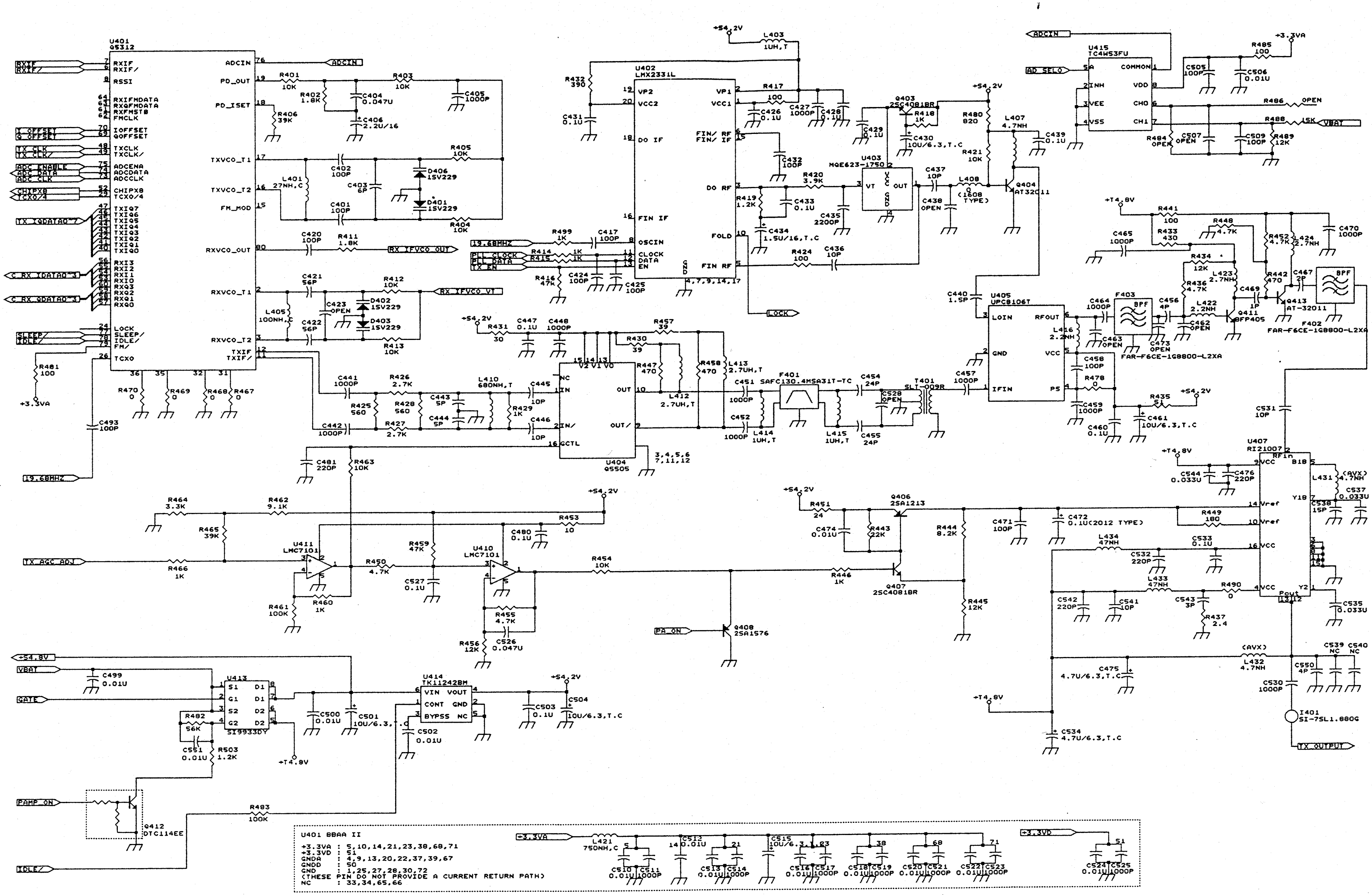
10-5 Logic Circuit Diagram



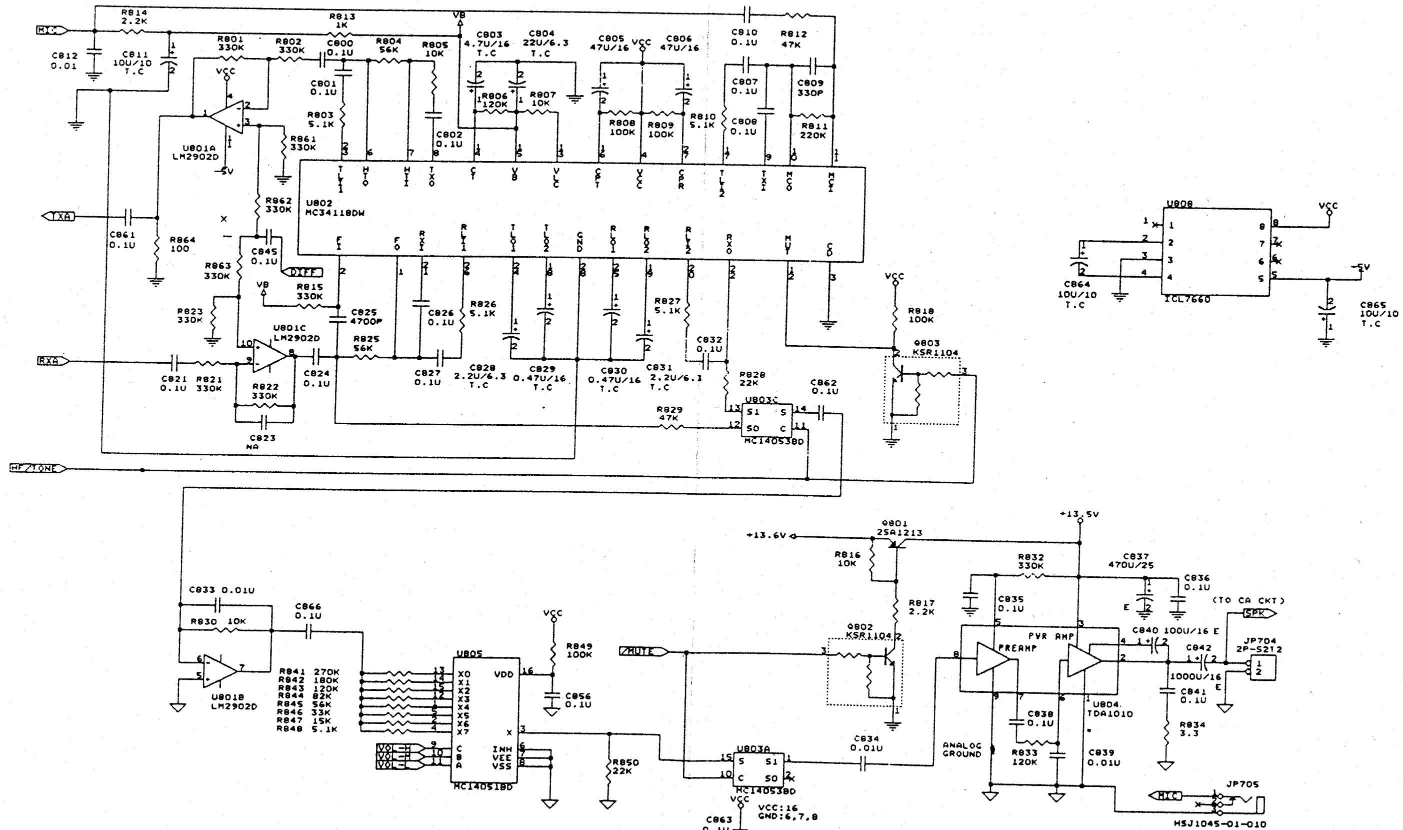
10-6 Receiver Circuit Diagram



10-7 Transmitter Circuit Diagram

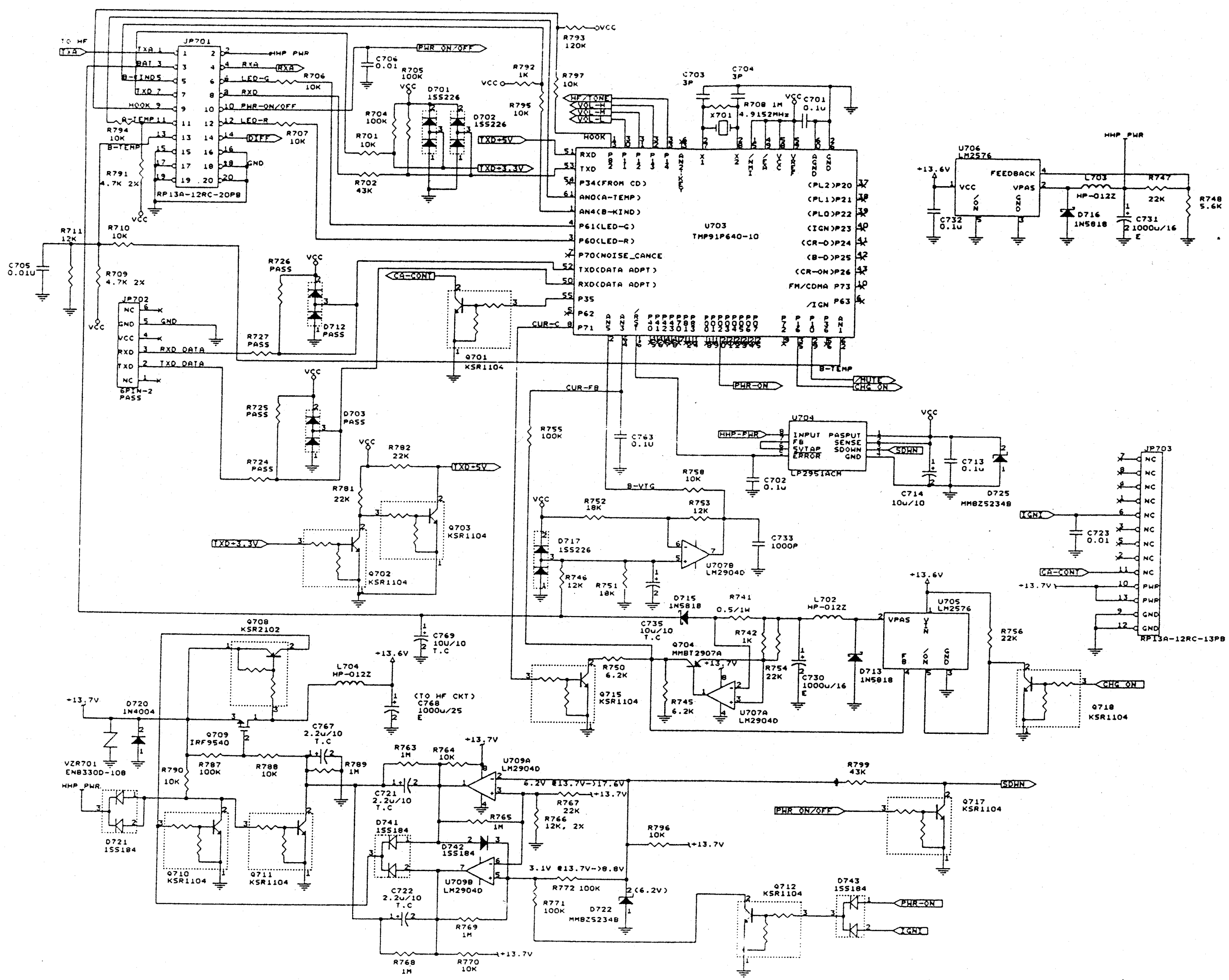


10-8 Hands-Free Circuit Diagram

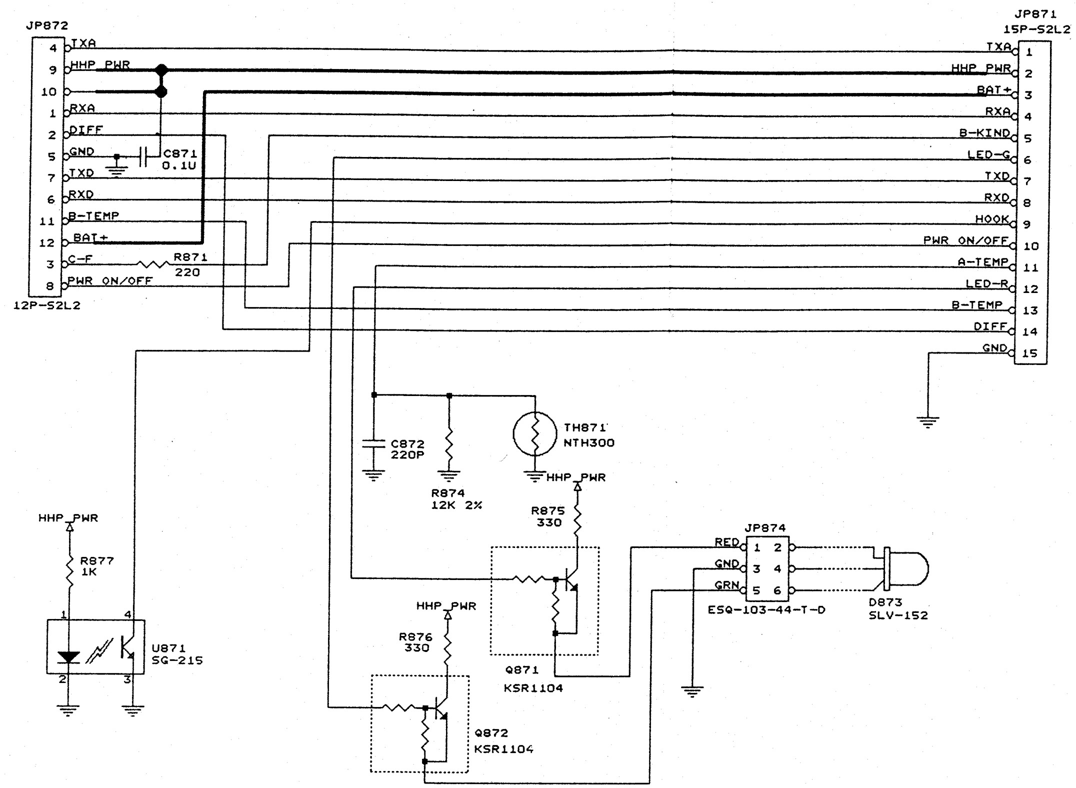


무선-03

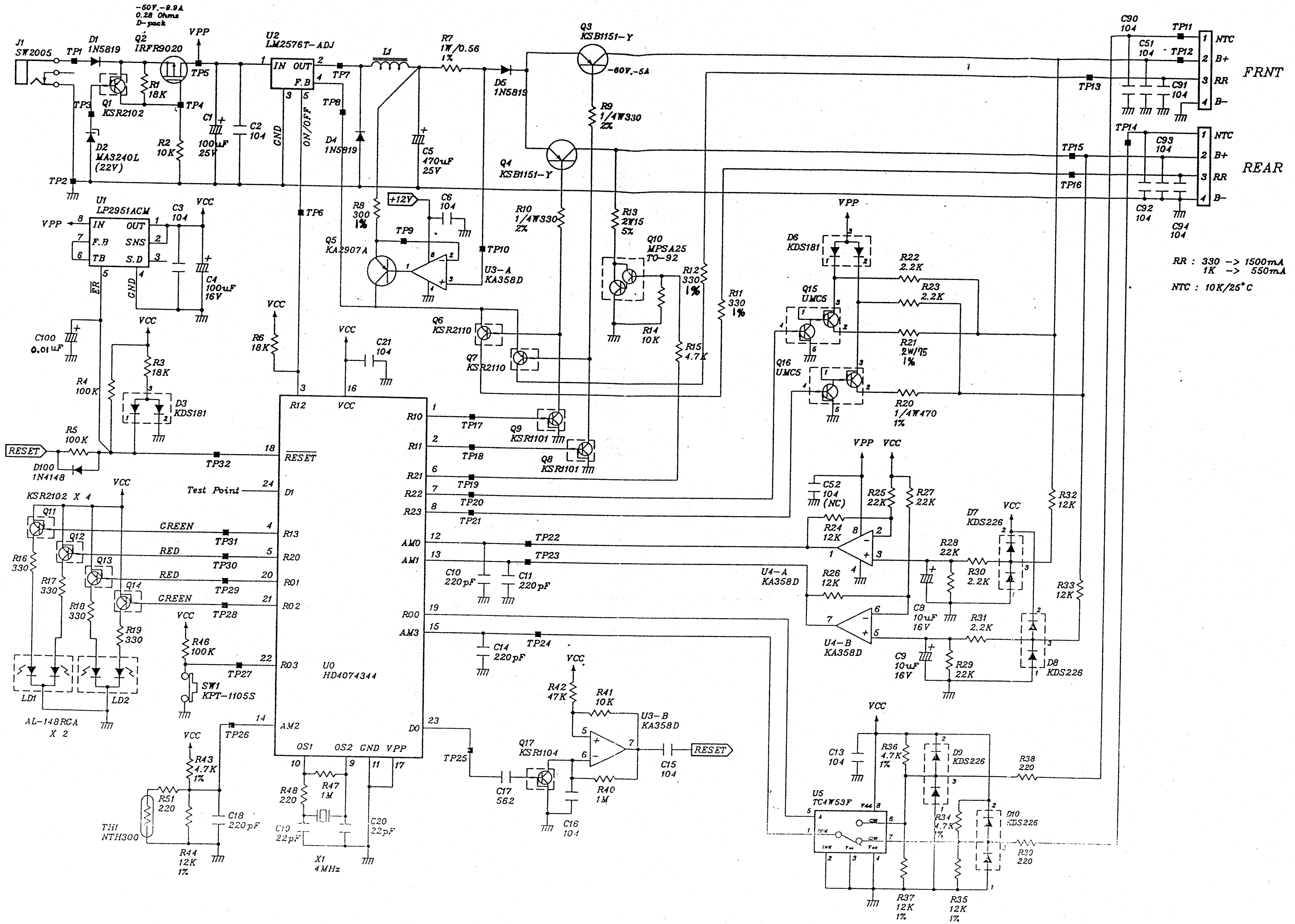
10-9 Car Adapter Circuit Diagram



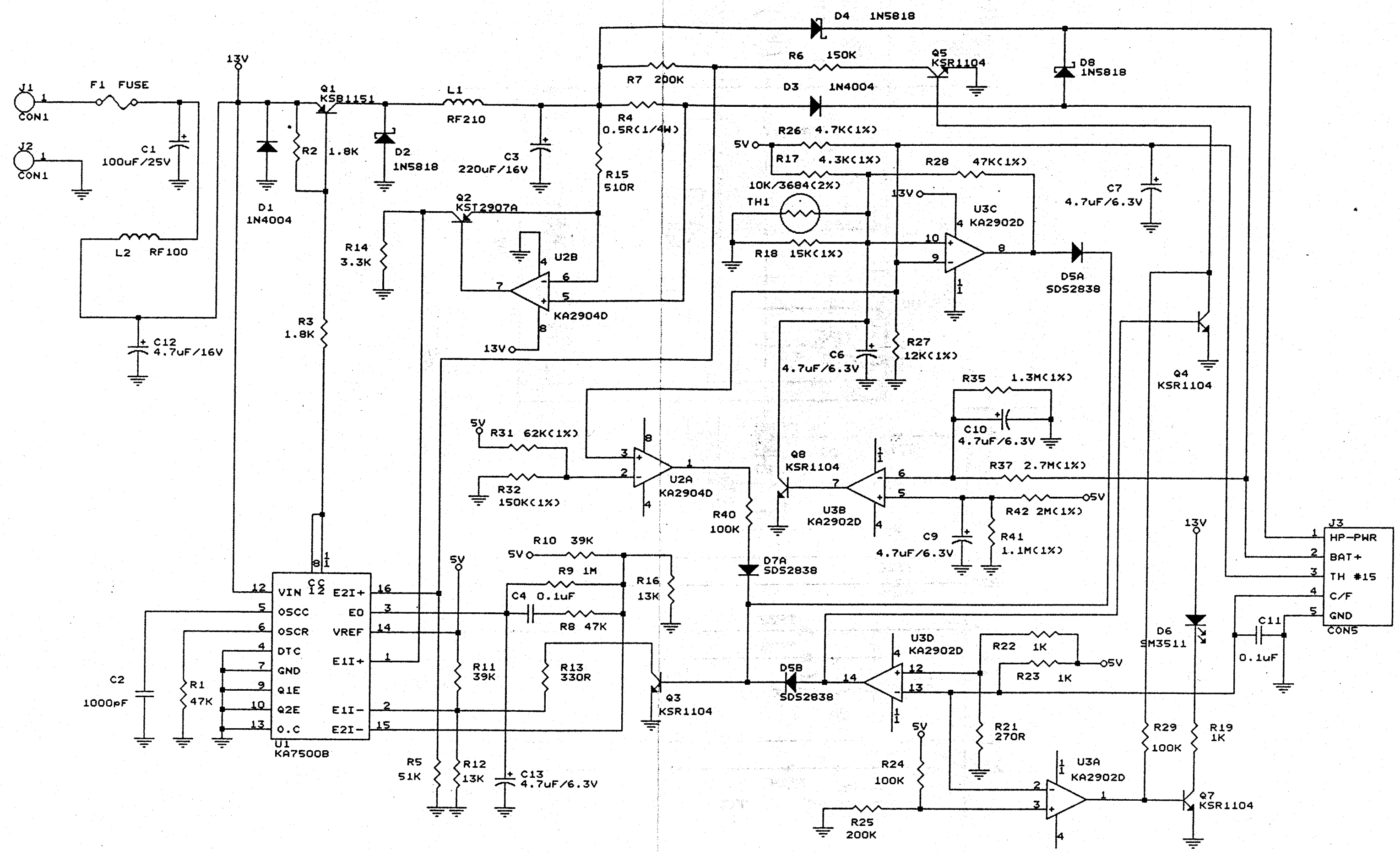
10-10 Cradle Circuit Diagram



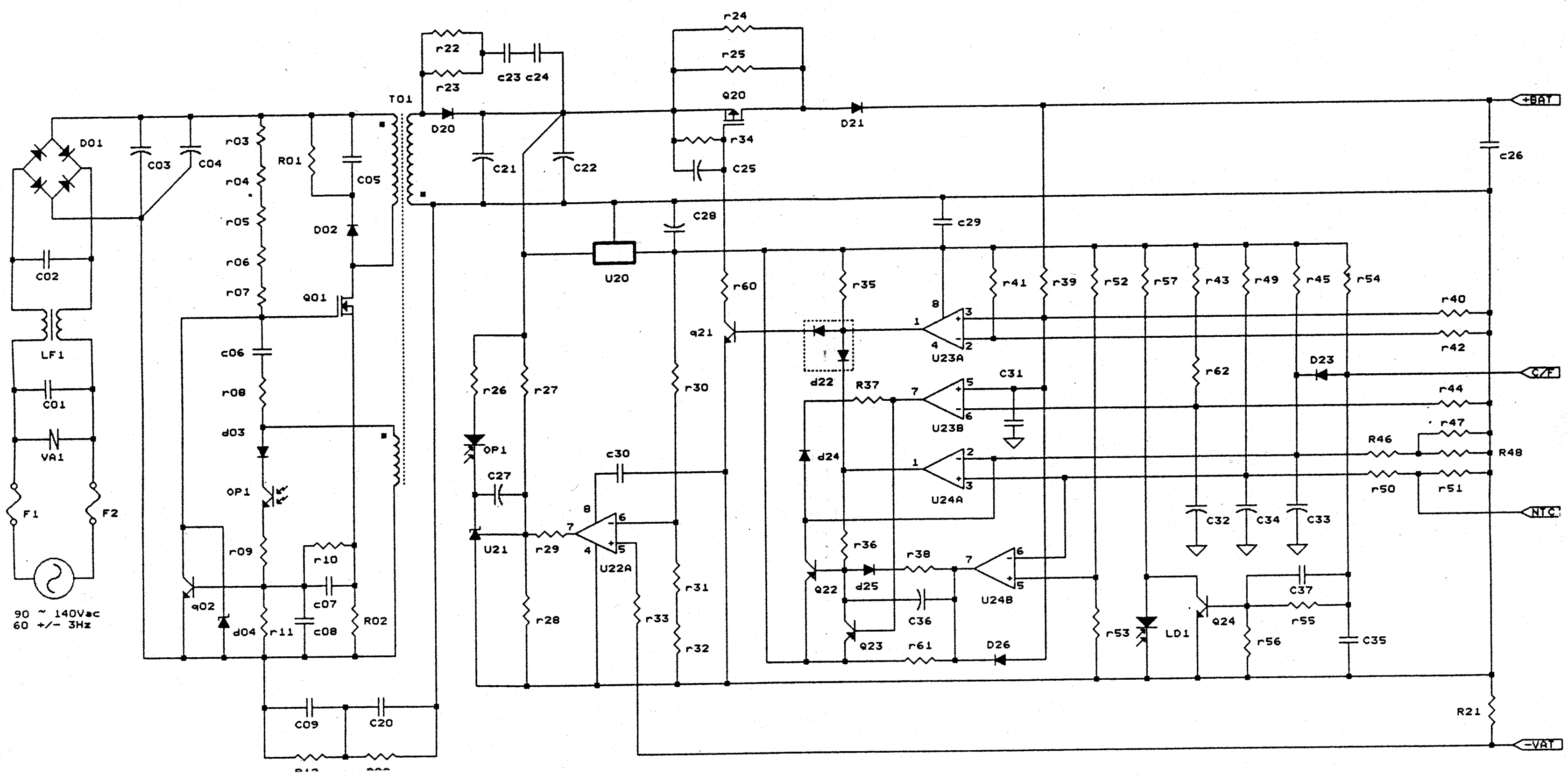
10-11 Desk-Top Rapid Charger Circuit Diagram



10-12 Cigarette Lighter Adapter Circuit Diagram



10-13 Travel Charger Circuit Diagram



무선-03